The World Health Organization (WHO) is a specialized agency of the United Nations and represents the culmination of efforts to establish a single inter governmental health agency As such it inherits the functions of antecedent organizations such as the Office International d Hygiène Publique the Health Organization of the League of Nations and the Health Division of UNRRA

WHO had its origin in the proposal made at the United Nations Conference held in San Francisco in 1945 that a specialized agency be created to deal with all matters relating to health In 1946 representatives of 61 governments met at the International Health Conference New York drafted and signed the WHO Constitution and established an Interim Commission to serve until the Con stitution could be ratified by 26 Member States of the United Nations The Constitution came into force on 7 April 1948 the first World Health Assembly met in Geneva in June 1948 and on 1 September 1948 the permanent Organiza tion was established

The work of the Organization is carried out by three organs the World Health Assembly the supreme authority to which all Member States send delegates the Executive Board the executive organ of the Health Assembly consisting of 18 persons designated by as many Member States and a Secretariat under the Director General

The scope of WHO s interests and activities exceeds that of any previous international health organization and includes programmes relating to a wide variety of public health questions malaria tuberculosis venereal diseases and tre ponematoses other communicable diseases maternal and child health mental health social and occupational health nutrition nursing environmental sanitation public health administration professional education and training and health edu cation of the public In addition WHO undertakes or participates in certain tech nical work of international significance such as the compilation of an international pharmacopoeia the setting up of biological standards and of standards for insec ticides and insecticide spraying equipment the control of addiction producing drugs the exchange of scientific information the drawing up of international sanitary regulations the revision of the international list of diseases and causes of death the collection and dissemination of epidemiological information and statistical studies on morbidity and mortality

TREPONEMATOSES

A World Problem

T GUTHE M D M P H

Chief Venereal Disease and Treponematoses Section
World Health Organization

R R WILLCOX M D

Physician in charge Venereal Disease Department
King Edward VII Hospital Windsor
Venereologist St Mary's Hospital London
WHO Treponematoses Consultant

WORLD HEALTH ORGANIZATION
PALAIS DES NATIONS
GENEVA
1954

This publication is a reprint of a special number of the *Chronicle of the World Health Organization* (1954 8 37 114)

NOTE

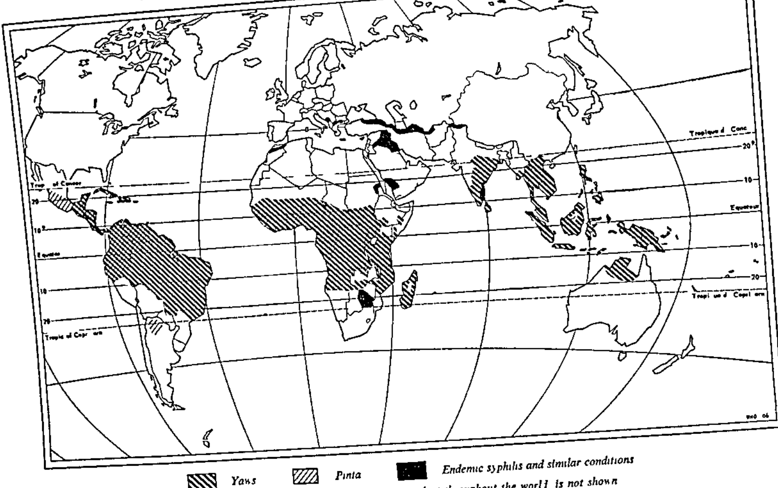
Authors alone are responsible for views expressed in this publication

PRINTED IN SWITZERLAND

CONTENTS

	Page
Changing concepts in the epidemiology and control of the treponematoses	5
Nature and extent of the treponematoses	7
New methods of control	21
National and international activities in treponematosis control	33
The control of venereal syphilis in various countries	36
Endemic syphilis in Bosnia	42
Bejel and dichuchwa	46
Mass campaigns against yaws	49
Syphilis control in special population groups	54
International exchange of scientific information	57
International co-ordination of research	62
Treponematosis control as a means to an end	68
Consolidation of results	69
Economic aspects of treponematosis control	71
Selective WHO bibliography on treponematosis control	74

FIG 1 GEOGRAPHICAL DISTRIBUTION OF THE NON VENEREAL TREPONEMATOSES



Venereal syphilis which is more or less prevalent throughout the world is not shown

CHANGING CONCEPTS IN THE EPIDEMIOLOGY AND CONTROL OF THE TREPONEMATOSES

It has become widely recognized in recent decades that despite the medical technical social and economic advances of the past century syphilis yaws and pinta represent a group of infections which continues to afflict a large proportion of the world s population (fig 1) Regions where they are prevalent must be considered as so many reservoirs of world infection exactly as are foci of malaria or yellow fever "[1] Furthermore since the treponematoses are closely related to each other biologically and immunologically and since the causative treponemes are all susceptible to penicillin there is an increasing demand for a comprehensive world view of these infections as a group which would replace a narrow approach based on differences in clinical syndromes mode of transmission or other characteristics peculiar to one or another From the point of view of public health and of communicable disease control there are definite advantages in the group concept which has in fact gained acceptance by scientists health workers and administrators in many coun*tries and has been the basis for practical measures taken to combat the treponematoses in* different regions of the world over the past few years

The study of the natural history of the treponematoses and their control require further definition of the relationship between the host and the parasite on the one hand and the *host and his physical social and economic environment on the other hand Significant* scientific developments and discoveries of recent years have added to our knowledge of these relationships and the introduction of new and more effective health techniques has resulted in a basic reorientation in treponematoses control

The isolation in the laboratory of a variety of strains and types of treponemes from various endemic areas of treponematoses in the world the ability to maintain treponemes alive on artificial media for some time the production in the experimental animal of relatively tissue free and concentrated treponemal antigens and the discovery of true immobilizing and agglutinating antibodies in the serum—as distinguished from the reagin type of " anti body " determined by usual serological methods—all these advances have greatly expanded our knowledge of the immunological and antigenic relationships among the different treponematoses

Since there is no intermediate host to attack in the treponematoses and since immunization procedures are impracticable at the present time the principal approach to treponematosis control remains case finding and treatment which must be carried out simultaneously with efforts to raise the social educational and economic level of the population concerned

[1] Q ted in H dson E H (1946) T pon mat s N w Y k p 116

In this domain too rapid strides have been made in recent years The introduction of penicillin as an effective treponemicidal drug to replace the toxic arsenicals and the development of repository penicillin preparations which will cure a high proportion of early infectious cases with a single injection and which will also arrest the advanced disease have made it possible for patients to be treated on an ambulant basis Penicillin will protect against infection on actual exposure and it is also effective when administered during the incubation period of a treponematosis This has permitted the administration of the antibiotic to contacts without overt signs of treponematoses in an effort to sever the chain of infection as rapidly as possible and this procedure has become an important epidemiological technique The triple effect of penicillin—curative in manifest disease preventive or abortive during the incubation period and prophylactic against exposure to contagion—has therefore made it a medical agent which can be successfully used not only in individual patients in clinical practice but also as an important public health weapon for the general improvement of health conditions by means of mass control programmes wherever the treponematoses are highly prevalent

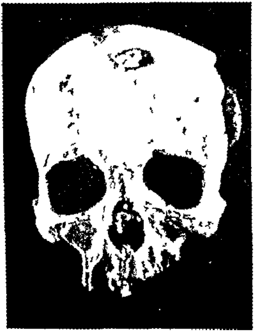
In the two articles which follow the nature and extent of the treponematoses and the new methods for their control are considered in some detail in order to provide background for subsequent sections on what has been accomplished and what remains to be done

NATURE AND EXTENT OF THE TREPONEMATOSES

EPIDEMIOLOGICAL HISTORY

The question of the antiquity and origin of the treponematoses is one of the classical controversies of medical history The finding of syphilitic bones from ancient peoples has given rise to various theories as to the geographical cradle of these infections some investigators considering it to be in the Americas others in Europe the Near East or Africa The recent discovery of possible bejel lesions in ancient bones found in the Eastern Mediterranean region has further emphasized this problem and has focused particular interest on the hypothesis of a single origin of the treponematoses According to this hypothesis one ancestral type of treponeme might through the ages gradually have adapted itself to widely differing environments in which climatic ethnological social economic and other factors have differently conditioned the

FIG 2 ANCIENT SYPHILITIC SKULL FOUND IN IRAQ





The antiqu ty of the t eponematoses has for many years been discussed by medical h storians Above is a skull believed to date from the first half of the first millenium A D which bears evidence of gummous osteoperiostitis This skull was discovered in 1939 near Zakho Iraq by the Government Archaeologist at the time Seton Lloyd In a recent study made in connexion with a WHO/UNICEF bejel-cont ol project D s F Kall of Vienna and A De F oe Di ector of the Anatomical Department of the Royal College of Medicine Baghdad attribute the pathological changes in the skull to a treponematosis

treponemes their mode of spread and the susceptibility of the host, with subsequent development of variations in the resulting clinical syndromes in man

Whatever their geographical or biological origin the treponematoses have been an international health problem throughout history and epidemic outbreaks have been recorded for centuries An infection similar to syphilis was known as seamen s jealousy in Chinese coastal towns in ancient times and the Biblical plague of Moab has been identified as syphilis To what extent it is possible to identify with syphilis an infection prevalent in eastern Europe many decades before the return of Columbus to Europe from the Americas at the end of the 15th century—and of which wooden illustrations of lesions are still to be seen in Cracow Poland—remains under discussion

The actual nature and extent of Morbus Gallicus which spread epidemically under many names in Europe after the rediscovery of the New World by Columbus and subsequently as a result of the travels of Vasco da Gama and other explorers to the Orient are one of the classical examples of an international epidemiological problem Medical historians are still debating whether this framboesia like disease was introduced or re introduced into Europe from Africa when the slave trade was opened up or whether it was brought from the West Indies by Columbus and indeed whether it was a true syphilitic infection which subsequently became modified after its transfer to the ancient world "True framboesia or yaws, as known today was not identified until early in the 17th century in the West Indies and in the 18th century in Brazil although a description was given as early as 1558 of a yaws like disease among Indian children in Rio de Janeiro and other areas of Brazil to which it may have been imported from Africa Since then yaws has gradually become recognized as an ubiquitous plague throughout the tropical belt The disease described as early as 1519 by Hernan Cortes during the period of Spanish conquest in the Western hemisphere was probably not yaws but the blue stain disease , or pinta identified in recent years as another member of the treponematoses group

There is historical evidence that many of the recorded epidemics of syphilis perpetuated themselves as extravenereal infections among children and that this mode of transmission was often mixed with venereal transmission among adults The sibbens or Scottish yaws , of the 17th century after the time of Cromwell, was apparently a mixture of venereal syphilis and such syphilis innocens transmitted through drinking bowls towels and other utensils and by suckling sleeping with infected persons etc The last case of sibbens was reported in Britain a little more than one hundred years ago The Norwegian radesyge of the 18th century has also been recognized as an extravenereal syphilitic disease and the *spirocolon* of *19th century* Greece and Russia was of a similar nature In the 18th century again Canada suffered outbreaks of syphilis among Indian tribes at St Paul s Bay and Lake Huron where the disease was very prevalent among children

Certain medical and social practices have undoubtedly also contributed to the spread of non venereal syphilis over the centuries An epidemic of syphilis is known to have resulted from cupping operations at the public baths in Moravia in 1587 and in France a midwife with a chancre on her finger infected 50 pregnant women in 1727 —an event not uncommon before the invention of rubber gloves In the days before artificial milks were used for baby feeding the wet nurse also contributed to the spread of the disease For example more than 40 women and children and several men developed syphilis in an epidemic in France in 1752 as a result of infection among wet

nurses who had developed nipple chancres through contact with syphilitic children Other children in due course infected their mothers and the husbands at the end of the chain of transmission acquired the disease venereally from their wives There are several accounts of the early periods of smallpox vaccination in which the arm to arm technique of vaccination is known to have resulted in the direct spread of syphilis from persons with infectious lesions The introduction of the eustachian catheter was also followed by a number of cases of transmitted syphilis Chancres resulting from circumcision procedures have frequently been reported in the literature And in modern times blood transfusion and the tattooer s needle have occasionally been responsible for the transmission of syphilis

THE PRESENT PROBLEM

The principal treponematoses—syphilis yaws and pinta—are infections resulting from the interplay of the environment the human host and the specific micro organism concerned which may be *Treponema pallidum T pertenue* or *T carateum* The fact that all the treponematoses except sporadic syphilis are essentially non venereally transmitted has been held to account for some of the differences (i e non occurrence of systemic cardiovascular and neurological involvement) between them and venereal syphilis but it does not explain the variations among the other treponematoses themselves

In contrast to those of syphilis the treponemes of yaws and pinta are apparently not transmitted sexually and the reciprocal partial immunity among the treponematoses which may represent a natural barrier to the introduction of venereal syphilis in areas in which the non venereal treponematoses are prevalent will gradually disappear once the latter have been controlled However the ultimate pattern of venereal transmission may even in developed countries revert to an extravenereal pattern given a return to conditions of poverty overcrowding war or a combination of factors which are conducive to the non venereal mode of transmission Thus local outbreaks of asexual syphilis among children were recorded in Budapest in 1948 [2] and in Chicago in 1949 [3] and were in both instances attributable to unfavourable social conditions On the other hand examples may be cited of males from underdeveloped areas who have acquired venereal syphilis on visits to large cities and who have venereally infected their wives on their return to their homes the wives in turn have infected the children non venereally and this has given rise under favouring environmental conditions to an epidemic of non venereal syphilis among the children in the area

Epidemic or endemic syphilis cannot continue to exist by non venereal transmission unless numerous environmental factors further this form of spread There is evidence that with improvement in hygienic conditions and with general social and economic advancement the non venereal type of syphilis has died out in many parts of the world although important areas where non venereal transmission predominates still exist in Europe the Middle East Asia Africa the Americas and the Western Pacific Experience in recent years has shown however that active communicable disease control programmes with emphasis on health education environmental sanitation and mass treatment with penicillin can accelerate the social and economic process by which the suppression of endemic syphilis—or of any of the other non venereal treponematoses—may be furthered And once the non venereal treponematoses have been sup

---

Féj E. (1948) *O Lap]* 4 616

Eise berg H Pi k F & B k A H (1949) *J ner Dis / f rm* 30 7

treponemes their mode of spread, and the susceptibility of the host with subsequent development of variations in the resulting clinical syndromes in man

Whatever their geographical or biological origin the treponematoses have been an international health problem throughout history and epidemic outbreaks have been recorded for centuries An infection similar to syphilis was known as "seamen s jealousy" in Chinese coastal towns in ancient times and the Biblical plague of Moab has been identified as syphilis To what extent it is possible to identify with syphilis an infection prevalent in eastern Europe many decades before the return of Columbus to Europe from the Americas at the end of the 15th century—and of which wooden illustra tions of lesions are still to be seen in Cracow Poland—remains under discussion

The actual nature and extent of Morbus Gallicus which spread epidemically under many names in Europe after the rediscovery of the New World by Columbus and subsequently as a result of the travels of Vasco da Gama and other explorers to the Orient are one of the classical examples of an international epidemiological problem Medi cal historians are still debating whether this framboesia like disease was introduced or re introduced into Europe from Africa when the slave trade was opened up or whether it was brought from the West Indies by Columbus and indeed whether it was a true syphilitic infection which subsequently became modified after its transfer to the ancient world "True" framboesia or yaws as known today was not identified until early in the 17th century in the West Indies and in the 18th century in Brazil although a description was given as early as 1558 of a yaws like disease among Indian children in Rio de Janeiro and other areas of Brazil to which it may have been imported from Africa Since then yaws has gradually become recognized as an ubiquitous plague through out the tropical belt The disease described as early as 1519 by Hernan Cortes during the period of Spanish conquest in the Western hemisphere was probably not yaws but the "blue stain disease" or pinta identi fied in recent years as another member of the treponematoses group

There is historical evidence that many of the recorded epidemics of syphilis perpet uated themselves as extravenereal infections among children and that this mode of trans mission was often mixed with venereal trans mission among adults The sibbens or "Scottish yaws" of the 17th century after the time of Cromwell was apparently a mixture of venereal syphilis and such "syphi lis innocens" transmitted through drinking bowls towels and other utensils and by suckling sleeping with infected persons etc The last case of sibbens was reported in Britain a little more than one hundred years ago The Norwegian "radesyge" of the 18th century has also been recognized as an extravenereal syphilitic disease and the "spirocolon" of 19th-century Greece and Russia was of a similar nature In the 18th century again Canada suffered out breaks of syphilis among Indian tribes at St Paul s Bay and Lake Huron where the disease was very prevalent among children

Certain medical and social practices have undoubtedly also contributed to the spread of non venereal syphilis over the centuries An epidemic of syphilis is known to have resulted from cupping operations at the public baths in Moravia in 1587, and in France a midwife with a chancre on her finger infected 50 pregnant women in 1727 —an event not uncommon before the inven tion of rubber gloves In the days before artificial milks were used for baby feeding, the wet nurse also contributed to the spread of the disease For example more than 40 women and children and several men developed syphilis in an epidemic in France in 1752 as a result of infection among wet

nurses who had developed nipple chancres through contact with syphilitic children Other children in due course infected their mothers and the husbands at the end of the chain of transmission acquired the disease venereally from their wives There are several accounts of the early periods of smallpox vaccination in which the arm to-arm technique of vaccination is known to have resulted in the direct spread of syphilis from persons with infectious lesions The introduction of the eustachian catheter was also followed by a number of cases of transmitted syphilis Chancres resulting from circumcision procedures have frequently been reported in the literature And in modern times blood transfusion and the tattooer s needle have occasionally been responsible for the transmission of syphilis

THE PRESENT PROBLEM

The principal treponematoses—syphilis yaws and pinta—are infections resulting from the interplay of the environment the human host and the specific micro-organism concerned which may be *Treponema pallidum T pertenue* or *T carateum* The fact that all the treponematoses except sporadic syphilis are essentially non venereally transmitted has been held to account for some of the differences (i e non occurrence of systemic cardiovascular and neurological involvement) between them and venereal syphilis but it does not explain the variations among the other treponematoses themselves

In contrast to those of syphilis the treponemes of yaws and pinta are apparently not transmitted sexually and the reciprocal partial immunity among the treponematoses which may represent a natural barrier to the introduction of venereal syphilis in areas in which the non venereal treponematoses are prevalent will gradually disappear once the latter have been controlled However the ultimate pattern of venereal transmission may even in developed countries revert to an extravenereal pattern given a return to conditions of poverty overcrowding war or a combination of factors which are conducive to the non venereal mode of transmission Thus local outbreaks of asexual syphilis among children were recorded in Budapest in 1948 [2] and in Chicago in 1949 [3] and were in both instances attributable to unfavourable social conditions On the other hand examples may be cited of males from underdeveloped areas who have acquired venereal syphilis on visits to large cities and who have venereally infected their wives on their return to their homes the wives in turn have infected the children non venereally and this has given rise under favouring environmental conditions to an epidemic of non venereal syphilis among the children in the area

Epidemic or endemic syphilis cannot continue to exist by non venereal transmission unless numerous environmental factors further this form of spread There is evidence that, with improvement in hygienic conditions and with general social and economic advancement the non venereal type of syphilis has died out in many parts of the world although important areas where non venereal transmission predominates still exist in Europe the Middle East Asia Africa the Americas and the Western Pacific Experience in recent years has shown however that active communicable-disease control programmes with emphasis on health education environmental sanitation and mass treatment with penicillin, can accelerate the social and economic process by which the suppression of endemic syphilis—or of any of the other non venereal treponematoses—may be furthered And once the non venereal treponematoses have been sup-

Fégr E. (1948) *Orv Lapja*, 4 616

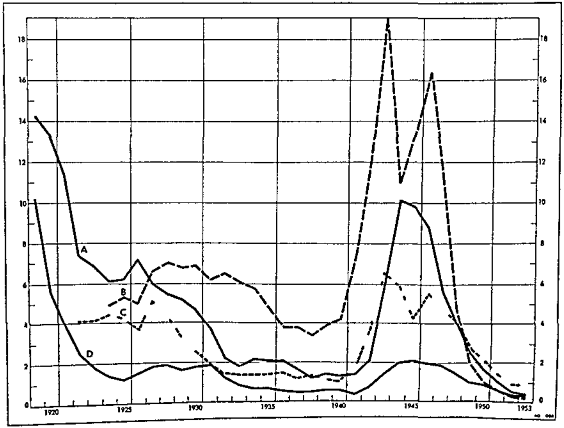
Eisenberg, H Plotke, F & Baker A. H (1949) *J vener Dis I form*, 30 7

pressed in populations with low socio economic standards emphasis will shift to new problems of disease control

VENEREAL SYPHILIS

Attempts to secure detailed information concerning the actual extent of the problem of venereal syphilis throughout the world suggest that at least 20 million cases exist although the data available are scattered and not always reliable It is not always possible though desirable for each area and country to be fully aware of its treponematoses problem and to include data on infectious syphilis at least in local and national health statistics Even an approximate estimate of the disease problem to serve as a basis for planning control programmes is not always obtainable In applied serology there may also be difficulties leading to an exagger ated opinion of the prevalence of syphilitic infection in tropical and semi tropical areas owing to the fact that seropositivity may be the result of one of the other treponematoses

FIG 3 ANNUAL CASES OF PRIMARY AND SECONDARY SYPHILIS PER 10 000 POPULATION REPORTED IN DENMARK FINLAND NORWAY AND SWEDEN 1919 53



Ordinates rate per 10 000

A — Denmark *B — Finland* *C — Norway* *D — Sweden*

(true seropositivity) or of false positive re actions caused by non treponemal infections

In spite of these limitations fairly reliable data are available for some countries where venereal disease control has been organized for some time as for instance in the Scandinavian countries where such activities date back to the 17th century In these and similar areas where it has been possible to measure trends over a period of time it has been observed that venereal syphilis remains predominantly an urban disease in "normal times It invades rural areas during times of poverty war and occupation and with migrating populations Following every major war its prevalence decreases with a return to normal economic and social conditions and with a stabilization of the population This decline in prevalence may be accelerated by systematic case finding by adequate treatment of cases and through educational efforts The incidence of early syphilis in the Nordic countries is illustrated for the period covering both World Wars in fig 3 and it is interesting to note the syphilis epidemics which occurred there during the war periods and in the immediate post war years The drop in the incidence of early infections was similar in Denmark and Norway after both the First and the Second World Wars after the Second however the rapid decline persisted and the incidence reached a minimum level without the long secondary drawn out process which spanned almost two decades after the First World War

In post war Germany where military occupation instability of the population and many other factors might have tended to maintain the incidence of venereal diseases at a relatively high level a continued decrease in the rate of early syphilis has been ex perienced following a maximum incidence in all three western occupied zones in 1947 A similar rapid decline seems to have fol lowed the post war peaks noted in Canada Finland France Italy Poland the United Kingdom of Great Britain and Northern Ireland and several other countries although it is difficult to appraise the situation accur ately since the statistical information is sometimes based only on patient loads at outpatient departments of venereal disease clinics which may not directly reflect quantity but rather indicate a general trend in a given area

The trend of syphilis incidence in the USA over the past few years is of considerable interest particularly in the light of the evaluation made by the WHO Syphilis Study Commission to the USA in 1950 [4] of the venereal-disease-control programme there after the introduction of penicillin This trend is illustrated in fig 4 and it will be seen that a rapid decline occurred in early infectious syphilis after penicillin had been introduced on a considerable scale

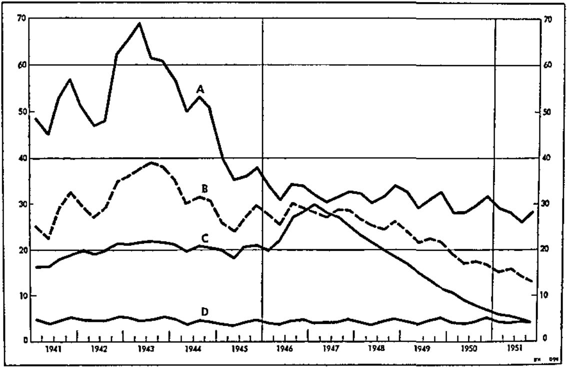
It is an inherent feature of the problem of venereal syphilis that regardless of general prevalence geographical distribution peace or war the majority of early cases occur in the productive age groups with a pre ponderance among young females who are often infected at an earlier age than the males This age and sex distribution may be seen in table I

Despite the rapid decline in the incidence of early syphilis in several western countries after the Second World War foci have continued to persist in some areas or among certain population groups in those countries Relaxation of venereal disease-control efforts misconception concerning the ease of modern therapy and lack of adequate maintenance of case finding and follow up work may even lead to recrudescence of the disease It has recently been reported that in 15 States of the USA the incidence of syphilis increased in 1953 [5] Long range planning and sus

Wld Hlth Org techn Rep Ser 1950 15

Cutler J C. (1953) Presentation before annual meeting of American Society for Investigative Dermatology

FIG 4 CASES OF ACQUIRED SYPHILIS IN THE USA (STATES AND TERRITORIES) BY FISCAL YEAR PERIOD 1941 51 *



Abscissae fiscal year quarters
Ordinates thousands of cases

A — Late and late latent
B — Early latent
C — Primary and secondary
D — Congenital

tained efforts are therefore necessary in any treponematosis-control programme As the reservoir of early infectious treponematosis is brought under control by extensive case finding and treatment the emphasis shifts to the late and latent stages of the disease the combating of which becomes a desirable public health objective This is the case in some of the more developed countries in which the former objective has begun to be attained

* Known mil t ry cases are cl ded

TABLE I AGE DISTRIBUTION OF 4 145 REPORTED CASES OF PRIMARY AND SECONDARY SYPHILIS IN NEW YORK CITY 1943

Age (years)	Number w th primary or secondary syph lis			Percentage with primary or secondary syphilis		
	males	females	total	males	females	total
under 15	4	14	18	0 1	1 1	0 4
15 19	306	305	611	11 4	^0 9	14 8
20-24	795	543	1 338	29 6	37 3	32 4
ـ5 ^9	511	88	799	19 0	19 8	19 3
30-34	365	152	517	13 6	10 4	12 1
35 39	253	76	329	9 4	5 2	8 0
40-44	195	37	232	7 3	2 5	5 6
45-49	1^9	21	1ـ0	4 8	1 4	3 7
50-54	71	15	86	2 6	1 0	2 1
ـ5 and over	59	6	65	2 2	0 4	1.6
Total	*2,688*	*1 457*	*4 145*	*100 0*	*100 0*	*100.0*

From the international point of view the extensive reservoir of syphilitic infection remaining in vast regions in several parts of the world is on the other hand of greater significance particularly in areas where facilities for diagnosis and treatment are limited and where venereal-disease-control activities have not previously been organized on an appreciable scale For example the prevalence of venereal syphilis has been reported* to vary from 14 1% to 32 9% of the population in certain areas of Africa syphilis surveys in South East Asia have shown a prevalence of seropositivity ranging from 0 6% to 31% in different population groups in Afghanistan from 2 4% to 25 4% in Burma from 0 5% to 11 9% in Ceylon and from 5% to 50% in India in the Eastern Mediterranean region recent extensive surveys have shown a range in Egypt of from 0 2% to 27% in Ethiopia of from 4 2% to 82% and in Saudi Arabia of from 8% to 22% and surveys of large population groups in the Americas have shown a range of from 12% to 15% There can therefore be no doubt that millions of cases of syphilis remain in these areas

It has been found that the prevalence of venereal infections particularly of syphilis is relatively higher in ports than in inland cities both in developed and in underdeveloped areas This raises the special problem of the possible transfer of infection from one country to another and has therefore been the object of particular international attention which is exemplified in the Brussels Agreement of 1924 for the treatment of seafarers in foreign ports (see page 55)

In short although there has been an initial significant decrease in early venereal syphilis in some parts of the world since the Second World War the problem of syphilis continues to be a health hazard in many other regions at a time when rapid transport by land sea and air is now available when desert treks and migrations have increased considerably in volume and when commercial intercourse between countries is accelerating under the vast economic development and expansion programmes in many underdeveloped areas

NON VENEREAL TREPONEMATOSES

The decline in early venereally acquired syphilis in some parts of the world in recent years has called increasing attention to the continued existence of endemic hyperendemic and epidemic areas of non venereal syphilis yaws and pinta Although precise statistics are still lacking there is a growing realization of the significance of these infections as public health problems and survey and control programmes -sometimes with international assistance—have begun to give some idea of their widespread distribution and considerable prevalence

Endemic syphilis and similar conditions

Syphilis has remained an ordinary communicable disease in several areas of the world transmitted non venereally by direct contact and by indirect transfer of *T pallidum* among children and adolescents through their play and by drinking vessels and common eating and other household utensils under primitive crowded substandard conditions of living Non venereal syphilis in its endemic form is an infection with epidemiological features which have furthered its spread primarily among children to such an extent that the epidemiological term " endemic syphilis " has by common usage become identified with the mere presence of the clinical syndrome most frequently found as the first sign of this childhood disease—namely oral mucous patches In Bosnia Yugoslavia such syphilis among children was widespread until very recently and in

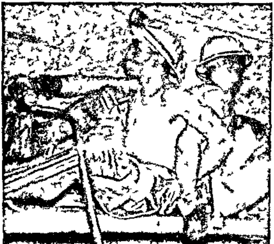
* Unpublished reports of WHO advisers or consultants (1949-57)

FIG 5 EXAMPLES OF MODES OF TRANSMISSION OF NON VENEREAL TREPONEMATOSES



A — Common use of drinking vessel (the "ibrik") in Bosnia a method of spread of endemic syphilis

(E I Grin Saraj o)



B — Transmission of yaws by direct skin contact of body surfaces of African miners

C J Hackett Lo d)



C — Chancre of the breast in mother nursing dichuchwa infected child having mucocutaneous lesions in the oral region

(I F M rr y J h nne b g)



Oral mucous lesions of non venereal syphilis (Bosnia)
(E. I Grin, Saraje)



Similar lesions in "njovera" (Southern Rhodesia)
(R R Willcox, Lo d)

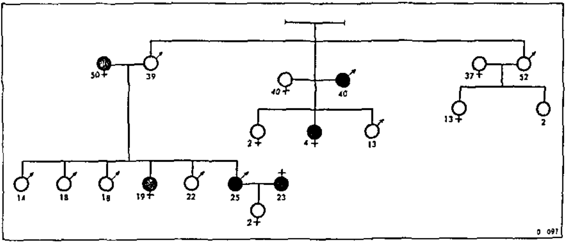
the neighbouring republic of Serbia a more mixed venereal and non venereal type of infection was found Prior to the mass treatment campaign of 1948 52 there were an estimated 100 000 cases (5/) among the two million inhabitants of the rural areas of Bosnia The high prevalence of infection among children and in the lower age groups in this area is illustrated in table II

There are no essential differences between the tegumentary lesions of endemic syphilis and those of sporadic venereally acquired syphilis in adults and the symptomatology *of both includes gummatous destruction of* the skeleton It is contended that cardio vascular and neurological involvement is present in the later stages of both But the rarity of primary lesions and of congenital manifestations is one of the characteristics of endemic syphilis and since they occur in the early age groups their incidence is different from that found in an environment where a venereal mode of transmission prevails and where sexually mature adults rather than children represent the population at risk

TABLE II NEW CASES OF ENDEMIC SYPHILIS BY AGE GROUPS IN A BOSNIAN COMMUNITY

Age (yea s)	P pulat o	Early nf t ous ca s	Cases per 1 000 of pop l t on
0 10	860	120	139 5
11 20	1 051	71	67 6
21 30	842	31	36 8
31-40	4.2	2	4 6
over 40	724	?0	27 6
Total	*3 909*	*44*	*62.5*

FIG 7 ENDEMIC SYPHILIS IN A HOUSEHOLD OF 19 MEMBERS (5 FAMILIES) IN BOSNIA 1951



Early secondary lesions   Latent   Clinically and serologically negative

Figures indicate the age of the individual

This difference is at least partially explicable on epidemiological and immunological grounds there is no evidence of a true difference in the strain virulence or tissue tropism of *T pallidum* in endemic or venereal syphilis

Studies of the prevalence of endemic syphilis in crowded households with little living space show that there is a considerable likelihood of many family members becoming infected The age and sex distribution in a typical household of this sort where two thirds of the persons living under the same roof were infected is shown in fig 7

In small communities the daily contact among inhabitants is usually more intense than in larger villages and it has been found that the more compact the community the higher the infection rate since there are more opportunities for the transfer of treponemes A survey of 322 Bosnian villages illustrated in the following tabulation shows a progressive decrease in the infection as the population in the villages increases

Village population	Infected %	Village population	Infected %
less than 200	22.5	400-600	12.6
200-400	16 2	over 600	9 1

Since the exhaustive studies by von During[7] on spirochaetosis in Mesopotamia and westward to the Mediterranean were made in 1896 a condition quite similar to if not identical with endemic syphilis has been described under the name of bejel by many investigators in various other parts of the Eastern Mediterranean region Apparently the condition is of some antiquity but whatever its origin it is found almost exclusively among Arabs in remote primitive desert villages in Iraq Syria and the Hashemite Kingdom of the Jordan where it has for many decades been recognized by the Bedouin as a common childhood and family infection Epidemiological and pathological descriptions of endemic syphilis and bejel have also been given in recent years by workers in Iran Saudi Arabia and other Eastern Mediterranean areas It has been estimated that this type of infection may afflict a million or more persons in this region

The early onset and the age and sex distribution of bejel are similar to what is found in endemic syphilis (see table II)

[7] Düring, E. von (1918) *Arch Derm Syph (Berl)* 61 3

The clinical resemblance of the initial stages of bejel to those of endemic syphilis is striking and has been described by a number of investigators[8, 9, 10] The lesions are usually confined to the skin mucous membranes and skeleton Primary sores are extremely rare and involvement of the cardiovascular or nervous system in the later stages has not been demonstrated with certainty in large series of patients although random reports suggest that it may occur It has been stated that the fundamental distinction between endemic non venereal syphilis and bejel or bejel like conditions lies in the presence or absence of systemic neurological and/or cardiovascular involvement in the later stages of the disease It is still not certain whether such involvement in endemic syphilis may not be attributable to cases of venereal origin in areas with mixed venereal and non venereal syphilis it is also debated whether the isolated cases of similar involvement in bejel are due to the same cause

Early reports of possible congenital bejel have not been confirmed where it has been possible to follow for any length of time children born of women seropositive at pregnancy Darkfield positive mucous patches and skin lesions including anogenital condylomata are common early manifestations Most patients go into latency after the early stages with subsequent development of late lesions of the skin and bone

In bejel as well as in yaws and possibly in endemic syphilis there is a seasonal increase in the attack rate with the coming of summer and the warmer weather Proximity to marshes or lakes may be among the physiographic factors facilitating the spread of infection in areas with poor hygienic standards although such factors appear to play a smaller role as environmental sanitation improves This has been demonstrated[11] in adjacent Iraqi villages inhabited by Kurds and Djibours respectively and where the conditions are remarkably different

A treponemal infection called njovera and closely resembling endemic syphilis and bejel has recently been described[1] in Southern Rhodesia among the Karanga people in Africa It is contended that bejel and njovera are identical and that both are in fact non venereal endemic syphilis

Dichuchwa has been described by McArthur[13] Murray et al [14] and others as another endemic extravenereal treponematosis among the Bantu people of Bechuanaland it appears to be mixed with venereal syphilis In both these non venereal treponematoses—njovera and dichuchwa—primary lesions are rarely seen except as throw back" transpositional lesions where a nipple sore develops in the mother from her infected child (fig 5 c page 14) The combination of darkfield positive mucous lesions and condylomata is common in both conditions which are otherwise characterized by the typical history of infection in childhood natural regression or rapid response to minimal treatment typical gummatous lesions in later life and the occurrence of the infection as a family and household disease Definite evidence has not been presented that cardiovascular or neurological involvement exists in either njovera or dichuchwa

These are examples of non venereal treponematoses recently identified in Europe the Middle East and Africa There is increasing evidence of the existence in various other areas of the world of similar foci of endemic non venereal syphilis or bejel like conditions bearing many strange names Such conditions have been identified in

---

Hass lman, C. M (1938) *A h D rm. Syph. (Chicag)* 38 837

H dson, E. H (1938) *Ame J t p M d* 18 675

W llcox, R. R. (1953) *Glasg m d J* 34 281

Csonka, G W (1953) *B it J Dis* 29 95

Willcox, R R. (1951) *Lanc t* 1 558

M Arth D C. (19.3) *Amer J Syph.* 7 3

M rray J F Merriweather A. M Keen, P & Sachs, S B (195) *M d Ill (Lond)* 6 407

FIG 8 TREPONEMATOSES IN BECHUANALAND



Gross nasopharyngal ulceration of five months duration with history of attack of dichuchwa in child hood which regressed spontaneously

(J F M rr y Joh ne b rg)

Macedonia Greece Turkey Lower Mongolia Tibet Tahiti India Saudi Arabia Niger (French West Africa) and the Americas They appear to be clinically and epidemiologically similar and are at least closely related if not identical It is suggested that an appreciable percentage of the population is affected in many areas and that the number of people at risk is in the millions

Yaws

Yaws is conditioned in its distribution by physiographic economic sanitary and other environmental factors and is highly prevalent in and almost exclusively confined to the belt between the Tropic of Capricorn and the Tropic of Cancer (see fig 1 page 4) It is estimated that there are some 50 million cases of yaws in all its forms in the world

In the Americas yaws is found in the northernmost countries of South America to only a limited extent in Central America (Panama) and most widely in the Caribbean area It has been estimated that there are some 350 000 cases of yaws in Brazil where it exists in almost every State although it is not a major problem in the southern part of the country The prevalence in 1948 in British and French Guiana was 26 4 and 41 3 per 100 000 of the population respectively It is a health problem in rural areas of Venezuela Colombia and Ecuador Probably the highest prevalence of yaws in the world existed until recently in Haiti where more than 50% of the population were afflicted There are reservoirs in the Dominican Republic Jamaica and Tobago

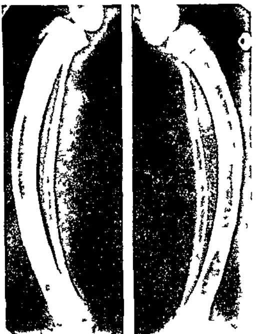
Africa has the largest single continental reservoir of yaws known Conservative estimates suggest that there are about 25 million cases of yaws in tropical Africa

In South East Asia yaws is prevalent throughout Indonesia and the peninsula comprising Malaya Thailand and the States of Indo China Its prevalence in Thailand and Indonesia where an estimated 12 15 million cases existed until recently is sharply declining under the mass control campaigns now under way in those countries The disease is also found in scattered pockets in southern India Burma and Ceylon

In the Western Pacific region yaws is encountered in many islands It is found in the Philippines New Guinea and in the Gilbert Ellis Solomon and other island groups sometimes with a very high incidence In Australia the irkintja or " boomerang leg among aborigines has been identified as yaws by Hackett [15]

[15] Hackett, C J (1936) *T ans roy Soc t op Med Hyg* 30 137

FIG 9 BONE LESIONS IN YAWS



X ray of boomerang leg observed among the aborigines of Australia

(C J Hack t, Lond)

Yaws is a disease of rural areas "at the end of the road" and its incidence is paradoxically associated with the presence of water It is on the one hand recognized that in remote tropical rural villages with little water and limited cleanliness the attack rate of yaws is higher than in areas where water can be used more freely for general domestic purposes On the other hand the attack rate increases significantly with the increased humidity of the rainy season Under crowded and primitive conditions the infection is easily transmitted by direct contact with secretions from infectious lesions and probably also by indirect contact

It is primarily a disease of childhood and adolescence Its early onset is illustrated in fig 27 page 72 The primary sore or "mother yaw often appears at the site of an abrasion and is seen on exposed parts of the body such as legs arms buttocks or face The initial lesions are roughly analogous to those in syphilis but those representing the different stages of yaws may appear far closer to each other in time than

FIG 10 ULCERATING TREPONEMATOSIS LESION COVERED WITH FLIES



Purulent secondary infections result from flies under unhygienic environmental conditions

(F Ka'l, V enn)

The manifestations of pinta are usually not physically incapacitating in the same way as those of syphilis bejel and yaws Pinta may however become a social and a mental health problem the sufferer from pinta of the blue white or mixed varieties may feel stigmatized and may sometimes not be accepted for employment in urban areas In this respect the infection is a hindrance to the full utilization of peasant labour in growing industrial areas or where there is urban development

---

NEW METHODS OF CONTROL

PENICILLIN AS A PUBLIC HEALTH WEAPON

The management of treponematoses has been completely revolutionized since penicillin was first shown more than ten years ago to be effective against this class of infection [18, 19] and since it was first successfully used by Mahoney and his co-workers [20] against venereal syphilis and then by other workers against endemic non venereal syphilis [21] yaws [2] bejel [23] and pinta [24] Numerous investigators have demonstrated that the use of penicillin brings about rapid disappearance of early lesions healing of lesions of the skin and mucous membrane reversal to seronegativity and in late manifestations an effect equal to or better than that observed with metal chemotherapy Long term studies in syphilis [2] have shown that when *adequate* amounts of penicillin are used adjuvant therapy with arsenicals and bismuth will not improve the clinical and laboratory results (fig 12 page 73)

T pallidum is one of the most sensitive micro organisms known As little as 0 0025 unit of penicillin per ml of serum will immobilize 50/ of a given number of treponemes within 16 hours yet in order to kill treponemes they must be exposed to penicillin in the blood and tissues for a longer time than most other micro-organisms After intramuscular injection the concentration of penicillin in the tissues increases in a definite relationship to that in the serum and the ultimate concentration in the infected organs is not appreciably lower than that in the circulating blood The amount of penicillin required to kill the treponemes in the host depends on their number and it is believed that they are most numerous in the secondary stage of syphilis before the immunobiological processes have come fully into play and the refractory stage has been reached It has been established that the minimum theoretical therapeutic " penicillin concentration in the blood is approximately 0 03 unit per ml Although it has been calculated that such a concentration maintained for 96 hours should be sufficient this treponemicidal level should be maintained for approximately one week in primary and two weeks in secondary syphilis to avoid the risk of any residual treponemes recuperating and multiplying anew It has not been shown that the treatment of syphilis is rendered more effective by maintaining a higher penicillinaemia or

---

Ll rpool Sch l f T pical Med 44 h Ann l R port A gu 1 1942—J ly 31 1943 p 9

Lo ne E M & Collie H O J (1943) *A t p M d P ast* 37 00

Mah y J F Arn ld R C. & Harris A (1943) *J ne D I f rm* 24 355

Grin, E. I (1953) *Epid mi l gy nd t l f nd mi ph l p t mas t tm t amp ign in B l* Genev (*W ld H al h Organi.at M gr ph S* N 11)

Findl y G M Hill K. & Macph rson, A (1944) *N ur (Lo d)* 154 795

Akrawi, F (1949) *B J D* 25 115

Rein, C R Kitchen D K Marquez, F & Varela, G (1957) *J Inv t D m* 18 137

Shafer J R & Usilto L. J (1954) *B ll Wld Hl h O g* (in press)

the corresponding lesions in syphilis Generalized secondary framboesides of the skin and lesions of the bone and joints may appear a few weeks after the initial lesion and persist for years with intermittent periods of apparent recovery and relapse if no treatment is given The plantar lesions known as crab yaws are particularly painful Tissue destruction takes place earlier and is a more constant feature in yaws than in syphilis Mutilation permanent invalidism and incapacitation for work result in many instances (See fig 9 and 23)

Although standard scientific classification of yaws lesions and a generally agreed nomenclature must await future action by an international group of experts the First International Symposium on Yaws Control convened by WHO in 1952 considered the immediate need for a simple general grouping of lesions as a basis for yaws control projects in the field where lesions are often recorded by auxiliary personnel with limited medical training this grouping was subsequently approved by the WHO Expert Committee on Venereal Infections and Treponematoses [16]

The true clinical course of yaws and the relationship between its stages are still under discussion

Pinta

Pinta is a public health problem in Mexico and Colombia where approximately 2% of the population are affected—with an estimated 250 000 cases in the former and 400 000 cases in the latter It is also found in Argentina Chile Cuba the Dominican Republic Ecuador Haiti Peru Venezuela and certain of the islands of the Antilles It is not with any certainty known to exist in areas outside the Americas Cases reported in other regions are more likely to be " pintide yaws "

[16] Wld Hlth Org techn. Rep Se 1953 63 33

T carateum was established [17] as th causative agent of pinta in 1938 The disease is essentially one of childhood and is contracted early in life by direct and indirect contact with infectious cases Its age distribution among series of untreated patients is illustrated in table III

TABLE III AGE DISTRIBUTION OF PINTA IN 665 MEXICAN INDIANS 1952

Age (years)	Number of cases	Percentage of total infected
1 5	60	9 0
6 10	143	21 5
11 15	134	20 1
16 20	115	17 3
21-30	141	21 2
31-40	47	7 1
41 50	17	2 6
51 and over	8	1.2
Total	*665*	*100.0*

Based on material from Rein C R, Kitchen D K Marquez F & Varela G (1952) *J invest Derm* 18 137

Clinical manifestations are confined to the skin and there is no certain evidence of congenital disease or of systemic cardiovascular or neurological involvement Primary pinta lesions are followed by secondary manifestations with localized and sometimes extensive dissemination as in syphilis These give rise to copper-coloured pigmented areas which turn slate blue Some of the pintides undergo depigmentation over extensive areas of the body surface becoming late " or white " pinta which represents the terminal stage of the disease The changes proceed in an irregular fashion with recurrence of secondary lesions periodically in the late stages of the disease and with a possible intermingling of all varieties of dyschromia hypochromia and achromia in the same patient

[17] Saenz, B Gra Triana, J & Alfonso Armenteros J (1938) *Arch. Inter M d.* 4 112

The manifestations of pinta are usually not physically incapacitating in the same way as those of syphilis bejel and yaws Pinta may however become a social and a mental health problem the sufferer from pinta of the blue white or mixed varieties may feel stigmatized and may sometimes not be accepted for employment in urban areas In this respect the infection is a hindrance to the full utilization of peasant labour in growing industrial areas or where there is urban development

---

NEW METHODS OF CONTROL

PE ICILLIN AS A PUBLIC HEALTH WEAPON

The management of treponematoses has been completely revolutionized since penicillin was first shown more than ten years ago to be effective against this class of infection [18 19] and since it was first successfully used by Mahoney and his co workers [20] against venereal syphilis and then by other workers against endemic non venereal syphilis [21] yaws [22] bejel [3] and pinta [24] Numerous investigators have demonstrated that the use of penicillin brings about rapid disappearance of early lesions healing of lesions of the skin and mucous membrane reversal to seronegativity and in late manifestations an effect equal to or better than that observed with metal chemotherapy Long term studies in syphilis [25] have shown that when *adequate* amounts of penicillin are used adjuvant therapy with arsenicals and bismuth will not improve the clinical and laboratory results (fig 12 page 73)

T pallidum is one of the most sensitive micro organisms known As little as 0 0025 unit of penicillin per ml of serum will immobilize 50/ of a given number of treponemes within 16 hours yet in order to kill treponemes they must be exposed to penicillin in the blood and tissues for a longer time than most other micro organisms After intramuscular injection the concentration of penicillin in the tissues increases in a definite relationship to that in the serum and the ultimate concentration in the infected organs is not appreciably lower than that in the circulating blood The amount of penicillin required to kill the treponemes in the host depends on their number and it is believed that they are most numerous in the secondary stage of syphilis before the immunobiological processes have come fully into play and the refractory stage has been reached It has been established that the " minimum theoretical therapeutic penicillin concentration in the blood is approximately 0 03 unit per ml Although it has been calculated that such a concentration maintained for 96 hours should be sufficient, this treponemicidal level should be maintained for approximately one week in primary and two weeks in secondary syphilis to avoid the risk of any residual treponemes recuperating and multiplying anew It has not been shown that the treatment of syphilis is rendered more effective by maintaining a higher penicillinaemia or

---

Liverpool School f T op cal Med cine 44th A al R port A gu t 1 1942—J ly 31 1943 p 9

Lourie, E. M & Collier H O J (1943) *A t p M d P ar l* 37 400

Mah ney J F Arn ld R. C & Harris A (1943) *J Dis Inf rm.* 24 355

Gri E I (1953) *Epid mi l gy nd o t l f nd mi philis port on ma s t tme t ampaign in Bo ia*, G nev (*W ld H l h Organiza Monogr ph S i* No 11)

Findl y G M H ll K, & Macpherson, A (1944) *N tur (Lond)* 154 795

Ak wi, F (1949) *B i J er D* 25 115

Rein, C. R., Kitchen, D K., Marquez, F & Varela, G (1952) *J Inve t Derm.* 18 137

Shafer J R & Ud n L J (1954) *B ll Wld Hlth O g* (In p ess)

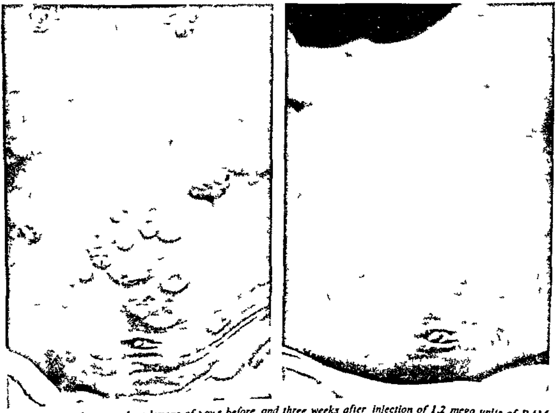
that there is any advantage in high, intermittent peak penicillin concentrations in the serum or tissues[26] The early clinical and laboratory studies were made particularly on syphilis but several subsequent studies confirm that there are no essential differences in this respect between syphilis and the other treponematoses although certain minor variations have been observed in penicillin sensitivity among strains of treponemes isolated from endemic syphilis bejel and yaws

The required penicillinaemia of long duration can be obtained with different penicillin salts and preparations provided that the dosage is adjusted to their characteristics and that the variables in the time dose relationship of penicillin therapy are taken into account Aqueous penicillin G injected several times daily during treatment necessitates hospitalization and is impractical for physician hospital and patient alike It will give intermittently high blood concentrations and a large proportion of the penicillin will be wasted The introduction by Buckwalter & Dickison[27] of a preparation of procaine penicillin G in oil with aluminium monostearate (internationally known as PAM) provided a practical product which gives a penicillinaemia of long duration when administered

Eagle, H Fleishmann R. & Levy R. (1953) *J Lab clin Med* 41 122

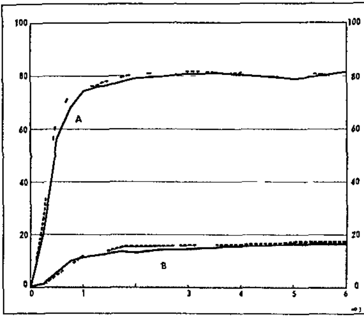
Buckwalt F H & Dickison, H L (1948) *J Amer ph m A* 37 472

FIG 11 IMMEDIATE EFFECT OF LONG ACTING PENICILLIN (PAM) IN THE TREPONEMATOSES



Maculopapular secondary lesions of yaws before and three weeks after injection of 1.2 mega units of PAM
(K R H ll Ki gston, Jamaica)

FIG 12 PENICILLIN ALONE COMPARED WITH PENICILLIN PLUS ARSENOXIDE AND BISMUTH IN THE TREATMENT OF SECONDARY SYPHILIS



Abscissae *years of observation*
Ordinates *cases (%)*
— *Penicillin alone (3 2 mega units)*
Penicillin (2.8 mega units) plus arsenoxide (300 mg) and bismuth (600 mg)
A — Seronegative
B — Re treated

in one or a few intramuscular injections This has made for a more rational utilization of penicillin from the point of view both of therapy and of economy It is however of paramount importance for the duration of the resulting penicillinaemia that such PAM preparations should have certain minimum characteristics for instance diffusion from the intramuscular depot into the blood and tissues should take place with reasonable and defined slowness notwithstanding the fact that individual variations have been observed in the rates of resorption and excretion through the kidneys Certain minimum physical and other requirements which PAM preparations should meet have therefore been specified by the WHO Expert Committee on Venereal Infections and Treponematoses [28] The desirability of following these international recommendations has been emphasized by the fact that several substandard PAM preparations have been found on the international market These may result in inadequate treatment of patients and excessive relapse rates

Recently new repository penicillin salts such as *N N* dibenzylethylenediamine dipenicillin G and *N* benzyl *β* phenylamine penicillin G have been introduced which alone [29] or in combination with other penicillin salts [30] may give a penicillinaemia for several weeks with smaller doses than are necessary with PAM Under WHO auspices these salts are at present under clinical trial in all the treponematoses in several parts of the world These studies will supplement the relatively few data which have been published on this type of therapy and which have so far been confined to syphilis A report on the first observations of the efficacy of *N N* dibenzylethylenediamine di penicillin G in yaws is in preparation Fig 13 shows the duration of the penicillinaemia re

Wld Hlth Org t hn. R p S 1953 63 55

Sh f J R. & Smith, C A (1954) *B ll Wld Hlth Org* (p es)

R in C, R B kw lt F H M nn C H. La dy S E. & Fl x, S (1951) *J I t D m* 21 435

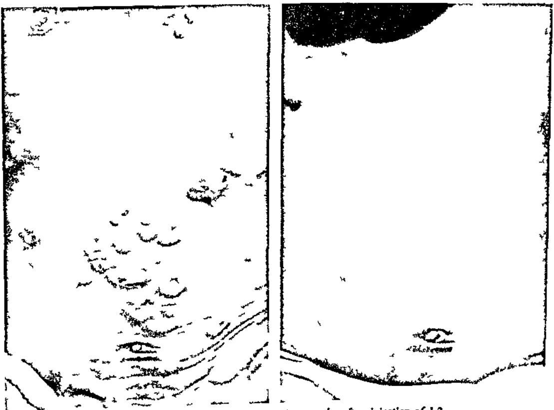
that there is any advantage in high intermittent peak penicillin concentrations in the serum or tissues [26] The early clinical and laboratory studies were made particularly on syphilis but several subsequent studies confirm that there are no essential differences in this respect between syphilis and the other treponematoses although certain minor variations have been observed in penicillin sensitivity among strains of treponemes isolated from endemic syphilis bejel and yaws

The required penicillinaemia of long duration can be obtained with different penicillin salts and preparations provided that the dosage is adjusted to their characteristics and that the variables in the time dose relationship of penicillin therapy are taken into account Aqueous penicillin G injected several times daily during treatment necessitates hospitalization and is impractical for physician hospital and patient alike It will give intermittently high blood concentrations and a large proportion of the penicillin will be wasted The introduction by Buckwalter & Dickison [27] of a preparation of procaine penicillin G in oil with aluminium monostearate (internationally known as PAM) provided a practical product which gives a penicillinaemia of long duration when administered

[26] Eagle H Fleishmann R. & Levy R (1953) *J Lab cl n Med* 41 122

[27] Buckwalte F H & D kison, H. L. (1948) *J Ame pha m Ass* 37 472

FIG 11 IMMEDIATE EFFECT OF LONG-ACTING PENICILLIN (PAM) IN THE TREPONEMATOSES



Maculopapular secondary lesions of yaws before and three weeks after injection of 1 2 mega units of PAM

(K. R H ll Ki gston, Jam ica)

anaphylactic shock in allergic individuals have been reported [33]

From the point of view of the patient the physician and the dispensary and from that of health insurance systems and health administrations responsible for clinic programmes and mass treatment campaigns it is essential that the treatment besides being without frequent serious side effects be effective inexpensive and capable of being completed within a short time An assessment of these four factors in different types of therapy in secondary syphilis is given in table IV page 26

The practical advantages of PAM brought out in table IV are undoubtedly responsible for the fact that this is at present the preparation of choice in the treatment of syphilis and the other treponematoses This was confirmed by a recent worldwide survey made by WHO which showed that more than 80/ of 277 leading venereologists and clinics relied on PAM alone in treating early syphilis and by the technical discussions at the Sixth World Health Assembly where PAM for treponematoses control was considered the drug which provided the maximum effect for the minimum expenditure [34]

The medical world requires time and experience to clarify the details of dosage and administration of any new drug and PAM in the treponematoses is no exception It has been demonstrated in the last few years that a progressive doubling of the dosage of PAM—and consequently of the cost—does not correspondingly prolong the penicillinaemia On the other hand the amount of penicillin required in any particular case increases with the number of treponemes present and while only 300 000 units of PAM may be needed to cure most cases of early primary seronegative syphilis this amount may cure only some 50/ 60/ of patients in the fully developed secondary stage in which larger amounts of PAM are required to obtain a higher proportion of cures In individual clinical programmes of the "urban demonstration and training project type fullest advantage should be taken of the properties of PAM using amounts of at least 2 4 to 4 8 mega units in the early stages of syphilis In selective public health programmes against the treponematoses considerations of administration and expense must however be taken into account when large numbers of infected persons are involved as in mass treatment campaigns and operational research in pilot areas has shown that as low a dosage as is compatible with reasonable clinical efficacy can be given in one or a few sessions Good results for the majority must of necessity be preferred to perfection for the few It is this calculated risk approach which has made it possible for health administrations with the assistance of international organizations to finance and undertake large mass campaigns against the treponematoses A minimum dosage of 1 2 mega units of PAM is recommended for adults by the WHO Expert Committee on Venereal Infections and Treponematoses for the treatment of the endemic treponematoses for venereal syphilis 2 4 mega units are recommended for primary and 4 8 mega units for secondary syphilis

The availability of penicillin is thus the key to treponematosis control as was pointed out several years ago by the WHO Expert Committee on Venereal Infections [3] In the early days of its use it was available only at a high cost to the privileged few and many other diseases which were more immediately fatal had first call on the supply Today it is produced in impressive quantities and the total world production in 1953 probably exceeded 500 tons corresponding to 300 000 000

W l h, H Lewis, C N Ke l d, I & P t m, L. E (1953) *A t b t and Ch m h* 3 891

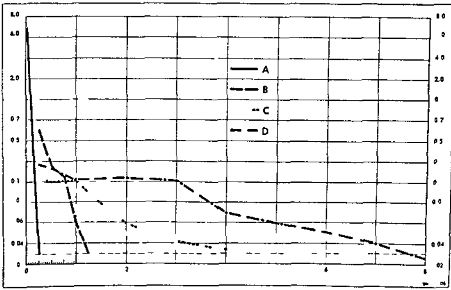
Ch Wld Hl h Org 1953 7 205

Off R Wld Hl h O g 1949 15 0

sulting from intramuscular injections of various salts and preparations of penicillin

In an appraisal of the value of penicillin in syphilis Reynolds[31] stated as early as 1946 that penicillin is effective but not always completely so It is in contrast to the metal chemotherapy non toxic approaching the ideal in this respect It is relatively easy to administer and therapeutically effective amounts can be administered in one or more repository intramuscular injections in a single session or if convenient in several sessions On the other hand evidence has accumulated that side effects may result in a small proportion of cases in allergic patients or in persons sensitized by repeated previous use (or misuse) of small doses of penicillin Considering that the consumption of penicil

FIG 13 PENICILLINAEMIA RESULTING FROM INJECTION OF VARIOUS PENICILLIN PREPARATIONS



Test dose 300 000 units given intramuscularly

Abscissae penicillinaemia duration in days *Ordinates penicillin units/ml of serum*

A — Crystalline penicillin G aqueous solution *C — PAM (Procaine penicillin G with aluminium monostearate)*

B — Procaine penicillin G aqueous suspension *D — DBED (N N dibenzylethylenediamine dipenicillin G)*

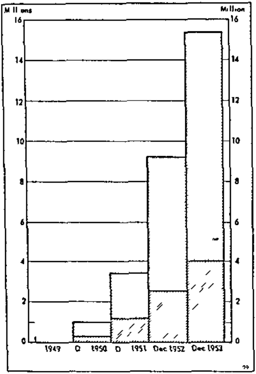
amounts can be given in a comparatively brief period of time Since then experience with penicillin therapy in the other treponematoses as well has steadily grown and it may now be said that this statement requires only little modification to be applicable to them also Indeed it has become clear with the passage of time that therapeutically effective lin has risen tremendously in all parts of the world in recent years it is noteworthy both that no penicillin resistance has so far been reported in the treponemes and that side effects are relatively infrequent and that their incidence is not increasing being estimated by Kitchen et al[32] at about 3 % 5% Isolated instances of death as a consequence of

[31] Reynolds, F W (1946) *Amer J Med* 1 661

[32] Kitchen D K Re C R Thomas, F W & Spo H J (1951) *Am J Syph* 35 578

mega units of penicillin of which the USA produced some 70/ Penicillin is therefore now more readily available for general use and with international assistance its beneficial effect in treating the treponematoses has been brought to millions of people (fig 14) Further production is planned or

FIG 14 NUMBER OF PERSONS PROTECTED AGAINST TREPONEMAL DISEASES IN MASS CAMPAIGNS 1948 53



under way in many areas of the world—sometimes with international assistance as in India Chile and Yugoslavia—and it may be said that the world may now have enough penicillin to meet its immediate needs but the demands of many countries are still below the level of medical necessity

An essential part of international aid to health administrations has thus been the supplying of penicillin for demonstration and training projects and for the first years of the mass treponematosis-control campaigns in underdeveloped areas

MASS TREATMENT CAMPAIGNS

Since yaws and other endemic non venereal treponematoses are found in rural and underdeveloped areas where medical facilities are absent or minimal their control requires a communitywide rather than an individual approach aimed at reducing the reservoir of infection as rapidly as possible to a level with which existing health facilities in the area can cope Treponematosis-control efforts in such areas have been based on a wide application of penicillin by the entirely new public health technique of mass treatment campaigns Since there is no immunization against the treponematoses and no intermediate host to attack and since facilities in rural areas are scarce this approach is the only possible one

Stages of a Campaign

Mass treatment campaigns are developed in five main stages [26] the importance of each being determined by local conditions These stages are

(*a*) general preliminary analysis of the problem (*b*) development of plans of operation (*c*) demonstration training and survey phase (*d*) expansion phase—the mass campaign proper—and (*e*) consolidation of the programme including its integration into the strengthened local health services

An important factor in any mass treatment campaign is the initial establishment of a pilot or control area in which selected groups may be examined treated and followed up by the different methods under investi

Rey lds, F W G the, T & Samame G (1951) *J vener Dis I f rm.* 32, 263

TABLE IV COMPARISON OF DIFFERENT TREATMENT METHODS IN SECONDARY SYPHILIS

Assessment factor	Ideal therapy	Metal chemotherapy		Combined therapy		Penicillin alone	
		Neoarsphenamine and bismuth four 3 month courses of 10 injections each	Arsenoxide 1 200 mg by intravenous drip over 5 days	Amorphous aqueous penicillin 5 mega units arsenoxide 360-450 mg bismuth 6 12 injections	Penicillin in oil beeswax or with aluminium monostearate 4 8 mega units bismuth 10 injections	Procaine penicillin G with aluminium monostearate 4 8 mega units	N N dibenzylethylene diamine dipenicillin G 2 5 mega units
Therapeutic efficacy	100	91 5	90 0	91 8	86 4	91 3	94 0 *
Toxicity by reactions	0	9 5	8 5	3	0 91	0 12	0 3
mortality	0	0 033	0 5	not reported	not reported	not reported	not reported
Convenience of administration	100	50+ (ambulant)	90 (hospitalized)	65 (hospitalized and ambulant)	75+ (ambulant)	95 100 (ambulant)	95 100 (ambulant)
Drug cost	—	92/8	190	—	10/4	9/9	10/8 12/6

Based on data from the *US* Public Health Service the British Clinical Co operative Group and the University Dermatological Clinic Oslo

Percentage of apparent cures at 24 months if the full course is given and adjusted for estimated reinfections in the case of penicillin schedules with no adjuvant therapy

Percentage of serious by reactions

Percentage of deaths due to treatment

Percentage of patients completing prescribed course of therapy

Drug cost to clinics in Great Britain in shillings and pence at 1953 prices

Includes seronegative and seropositive early syphilis

21 months follow up

cases all children at risk under 15 years of age are included and in areas of very high prevalence all community members may be considered to be at risk and treated as contacts

Much experience has been gained in these campaigns and has been detailed in various technical publications by investigators of many nationalities It is not intended to elaborate on this experience further in the present review of WHO activities on treponematoses control However consideration will be given later to some of the problems encountered in the expansion pha e of the mass campaign to the consolidation of the initial knock down effect achieved by mass application of penicillin early in control programmes and to the integration of the treponematosis control programme into the general health services of the area

Cost of Campaigns

The larger part of campaign costs are borne by the governments which are responsible for the projects The costs are naturally higher in the earlier stages of the campaigns since the initial investment in equipment training of personnel and organization is considerable

It has already been pointed out (page 26) that the drug cost per patient completing treatment is now lower with penicillin than with metal chemotherapy Early in the yaws campaigns penicillin was more expensive *than it is now and the total average cost per* person examined and treated in mass campaigns has for this reason also decreased since the inception of the campaigns[38] Nevertheless the cost of penicillin represents approximately half the expenditure per person treated in mass campaigns The remaining costs concern project personnel maintenance of transport and non consumable equipment replacement of consumable supplies and hundreds of items relating to central and field administration

In order to show the total costs and the cost per person examined and treated including national and international commitments these items are illustrated for three major mass campaigns in table V The costs per person examined and per person treated have been calculated as averages from the beginning of each campaign up to and including December 1952 as has been indicated above these costs decrease as the campaigns develop For the period ending 1952 the cost per person treated ranged from $2 33 to $4 00 and per person *examined from $0 39 to $0 43 Operational* research in pilot and control areas showed that a single injection of a smaller dose of penicillin could replace the technique and

Keeny S (1953) *B ll Wld Hlth O g* 8 379

TABLE V DISTRIBUTION OF COSTS AND COST PER PERSON EXAMINED AND TREATED IN THREE WHO/UNICEF AIDED TREPONEMAL-DISEASE CONTROL CAMPAIGNS

Programme area	Contribut on (US $)					Cost per pe son e am ned (U. $)	Cost per person t eated (US $)
	Govern ment	UNICEF	WHO	tot l	Governme t as pe cent ge of total		
Ph l pp nes	76 122	24 884		101 006	75 4		4 01
Thailand	369 832	2 9 511	33,534	662 877	53 8	0 43	2 76
Indones	718 310	855 ?00	19 317	1 59? 827	45 1	0 39	2 .3
Tot l	*1 164,264*	*1 139 595*	*52,851*	*2,356 710*	*49 4*	*0 41*	*3 30*

From begin ing of camp ig s to d of 1952

I cludes temporary co sult t only

gation and where full facilities are available for proper serological and other tests for the recording of results and for epidemiological evaluation The experience gained from such operational research in the pilot or control areas may then be applied in a more general fashion to the campaign area as a whole and the principles established there put into practice in projects elsewhere At the outset little experience was available on how to conduct mass campaigns but now as a result of work done by health administrations and WHO experience is steadily mounting and there can be little doubt that the investments in such operational research will pay practical and scientific dividends as the wider programme develops a point which will be discussed later (see page 62)

Conduct of a Campaign

Several important lessons have been learned from the mass campaigns which have been carried out in recent years

1 It is desirable in a mass campaign to examine the entire population If this is not done some infectious cases will be missed and the campaign may fail Experience in Haiti *has shown that the entire population* cannot be examined by setting up permanent clinics and relying on the voluntary attendance of the patient Even with suitable propaganda less than 50% of the population may be reached If mobile clinics are also provided in strategic areas this figure may increase to 70% and if a house to-house survey is made the percentage will be 90 or more It is now appreciated that a house to house technique *is the best method* of case finding for most mass treatment campaigns

2 It is necessary to revisit an area after mass treatment It is evident that follow up examinations are essential in order to deal with cases missed at the first examination owing to default or because they were in the incubation period at the time with patients who have relapsed or with persons who have recently migrated into the area At these resurveys it is necessary to examine the entire population again Experience in Indonesia and elsewhere has indicated that most of the infectious cases discovered in the villages that were re examined would have been missed if the group originally treated had been the only one studied It is considered therefore that in order to obtain a lasting effect in mass campaigns against yaws the entire population should be resurveyed at intervals of approximately one year in areas of initial high prevalence of infection

3 It is necessary to give preventive or abortive treatment to contacts Experience in Haiti Thailand and Yugoslavia has *emphasized the importance of treating contacts* who may have no overt signs of disease In the treatment of venereal syphilis this matter is still controversial although Alexander et al [37] have demonstrated that penicillin can afford almost complete protection to persons exposed to the infection However there is no doubt that in the endemic non venereal treponematoses e g endemic syphilis and yaws the treatment of *apparently non infected contacts with penicillin* is not only an effective but also an essential epidemiological procedure Without it control campaigns may in the long run fail not only because persons in the incubation period will later develop the disease but also because latent cases which remain undetected when no serum tests are made may relapse

Contacts have been differently defined in different campaigns according to the prevalence of *the disease and to environmental* conditions In some cases a limited definition has been used the term including only members of infected households in other

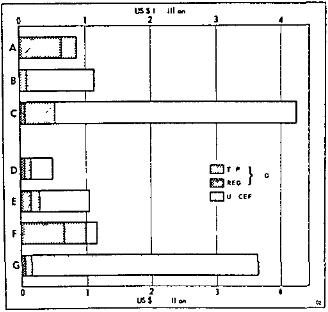
---

[37] Alexander L J Schoch A G & Mooth W B (1949) *Amer J Syph* 33 429

dosage initially used in several of the mass campaigns provided that the PAM met WHO specifications A saving of 34% in the expenditure for penicillin was thus effected and operational costs were also reduced by the simplification of campaign procedures The cumulative effect of this and the other factors already pointed out above has permitted the forecast that the cost per person examined and per person treated in such campaigns will drop to $0 10 and $1 00 respectively in 1954

Information concerning the costs of campaigns other than the three listed in this table is thus far less precise However the significant long range commitments of health administrations in treponematosis control may in general be illustrated by fig 15 which shows national and international funds expended or allocated during the five year period 1949 53 It will be noted that the information is given by type of project and category of expense for mass campaigns for demonstration and training projects and for projects with emphasis on the control of prenatal and infantile syphilis all of which are discussed in the following section

FIG 15 NATIONAL AND INTERNATIONAL FUNDS FOR TREPONEMATOSIS CONTROL 1949 53



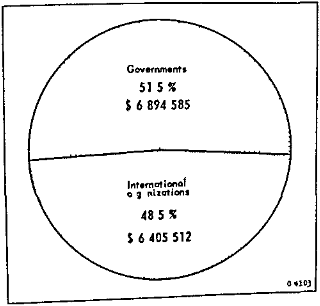
A — Demonstration projects
B — Maternal and child health/venereal disease projects
C — Mass campaigns

International expenditure by type of project and source of funds

D — Transport
E — Laboratory equipment and supplies
F — Personnel
G — Penicillin

International expenditure by category of expense and source of funds

TAP = Tech l l A ist P g mm
REG = R g l Budg t



National expenditure average percentage in four major campaigns used as basis for calculation of national expenditure in total programme

NATIONAL AND INTERNATIONAL ACTIVITIES IN TREPONEMATOSIS CONTROL

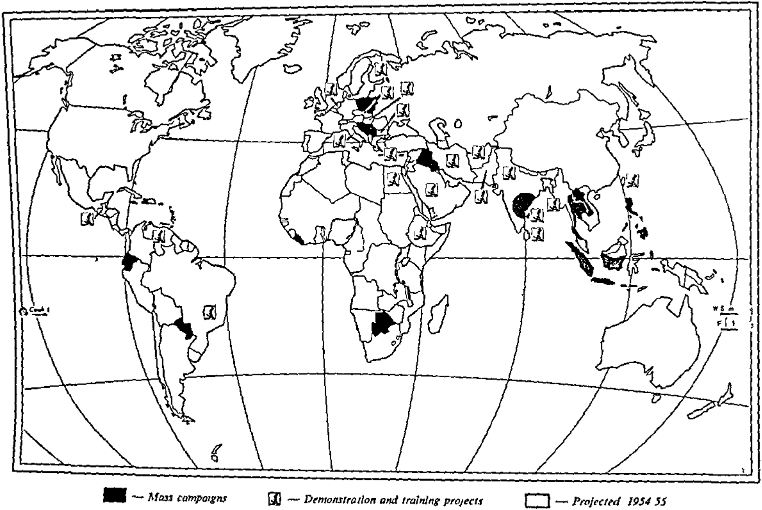
Since the Second World War a number of governments in various parts of the world have wished to take advantage of and to participate in international co-operation for the control of the treponematoses This international co-operation has taken several forms

First many health administrations which have attacked the treponematoses problem with new control methods based principally on case finding and on penicillin treatment of cases and contacts have found it desirable to draw upon the experience and advice of health workers in other countries through the medium of WHO and upon the co-ordinated assistance of WHO and UNICEF in providing supplies and equipment not locally available (e g Indonesia Haiti Thailand) The technical aid of WHO under its regular budget or under the United Nations Technical Assistance programme is frequently given to develop mass treatment campaigns described previously as a new public health technique in the control of the treponematoses

A second type of activity has been the establishment or strengthening of demonstration and training projects This has in the past proved a useful form of international health aid and some countries (e g Ceylon Egypt India) have developed projects based on this approach A well-equipped venereal disease centre is established as a model for others to be set up later in different areas by local health administrations and to serve as a training base for medical and auxiliary personnel Such a centre or clinic is usually directed and operated by national staff assisted by an international team of advisers which may include a venereologist a serologist a public health nurse and sometimes a health education specialist In addition to diagnosis and treatment the activities comprise epidemiological measures including case finding through home visiting Serological services not only are used for diagnosis and follow up of cases treated in the centres but also are applied to special wider samples in different population groups and in other parts of the country as the project develops The demonstration and training centre is usually in an urban area and is in a way supplementary to the mass treatment campaign justified in rural areas in which facilities are mobile and activities simplified because of the prevalence of the treponematoses and the more primitive conditions of health and environment in which it is carried out

A third approach has been adopted in some countries with special problems of syphilis control in these as part of the general health programme advantage has been taken of maternal and child health services in order to find cases of syphilis and to give treatment to children adolescents pregnant women and nursing mothers This approach was used in Finland and in some of the eastern European countries immediately after the Second World War In other countries such as Afghanistan Burma Pakistan and Taiwan venereal disease control has been further emphasized in the maternal and child health programme by having a special section on venereal disease control within the framework of the activities of the WHO advisory team

FIG 16 NATIONAL TREPONEMATOSIS CONTROL PROJECTS INTERNATIONALLY AIDED UNDERTAKEN 1948 53 OR PROJECTED 1954-55



tological Congresses and the International Union against the Venereal Diseases—the programme of national health administrations and WHO may obtain support from voluntary organizations and professional societies in many countries WHO maintains official relationships with the International Union against the Venereal Diseases and various joint projects have been undertaken such as the publication of information on national venereal-disease legislation throughout the world

These various phases of the Organization s work will be considered in the articles which follow though it must be emphasized that only a general review can be given here and that this account does not claim to be a complete catalogue of national and international treponematosis control activities Further information concerning national projects and WHO s programme in treponematosis control may be found in the medical literature including other WHO publications such as the *Bulletin of the World Health Organization* the Monograph Series the Technical Report Series and the *Official Records of the World Health Organization* including the Annual Reports of the Director General

WHO OBJECTIVES IN TREPONEMATOSIS CONTROL

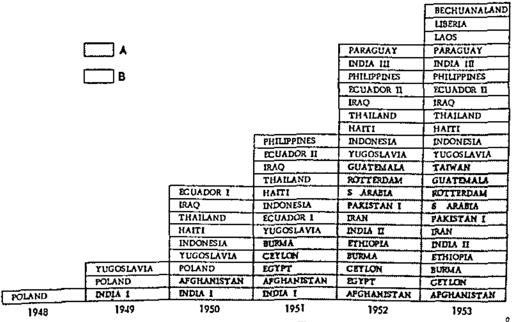
1 To stimulate the development of intensive and comprehensive health projects so that the treponematoses can be eliminated as public health problems and by such projects to contribute to the strengthening of local and national health services

2 To contribute to the establishment in Member States of a practical degree of control of venereal syphilis (and other venereal infections) and to the prevention of their spread between countries and within special population groups

3 To stimulate teaching and training activities to promote studies and exchange of scientific information and to foster simplification and standardization of health techniques through operational and laboratory research, in an effort to co-ordinate national and international treponematosis-control activities

The above aspects of treponematosis control call for special national efforts and long term commitments under the communicable disease control programmes of the countries concerned WHO s role is to meet the governments requests for technical aid through its machinery of regional offices advisers and consultants assigned to specific projects In the five years from 1948 to 1953, WHO has assisted health administrations in many countries and in all regions in treponematosis control Fig 17 illustrates the expansion of the programme on a geographical basis for mass campaigns and for demonstration and training projects The expanding nature of internationally aided programmes in terms of the increasing number of persons protected against the treponemal diseases in mass campaigns during the past several years has already been illustrated in fig 14 (see page 27)

FIG 17 TREPONEMATOSIS CONTROL PROJECTS ASSISTED BY WHO AND UNICEF 1948 53



A — Demonstration and training projects B — Mass campaigns

Rom n num als ind t mo e than project in the s m t y

In addition to aiding national efforts such as these WHO has a more directly inter national function in co ordinating and stimulating treponematosis control on an inter-country and inter regional basis As an international co ordinator of health activities WHO also grants fellowships sponsors training courses organizes seminars symposia and international conferences encourages the exchange of scientific information provides technical guidance through its expert committees furthers the standardization of serological reagents and methods co-ordinates special studies on particular treponematoses problems and under takes operational research aiming at the simplification of health techniques

Finally through collaboration with international non governmental organizations inter ested in venereal disease and treponematosis control—such as the International Derma

tological Congresses and the International Union against the Venereal Diseases—the programme of national health administrations and WHO may obtain support from voluntary organiza tions and professional societies in many countries WHO maintains official relationships with the International Union against the Venereal Diseases and various joint projects have been undertaken such as the publication of information on national venereal-disease legislation throughout the world

These various phases of the Organization s work will be considered in the articles which follow though it must be emphasized that only a general review can be given here and that this account does not claim to be a complete catalogue of national and international treponematosis-control activities Further information concerning national projects and WHO s programme in treponematosis control may be found in the medical literature including other WHO publications such as the *Bulletin of the World Health Organi ation* the Monograph Series the Technical Report Series and the *Official Records of the World Health Organi ation*, including the Annual Reports of the Director General

WHO OBJECTIVES IN TREPONEMATOSIS CONTROL

1 To stimulate the development of intensive and comprehensive health projects so that the treponematoses can be eliminated as public health problems and by such projects to contribute to the strengthening of local and national health services

2 To contribute to the establishment in Member States of a practical degree of control of venereal syphilis (and other venereal infections) and to the prevention of their spread between countries and within special population-groups

3 To stimulate teaching and training activities to promote studies and exchange of scientific information and to foster simplification and standardization of health techniques through operational and laboratory research, in an effort to co-ordinate national and international treponematosis-control activities

THE CONTROL OF VENEREAL SYPHILIS IN VARIOUS COUNTRIES

Eastern Europe

Aid from UNRRA was requested by several health administrations in eastern Europe after the Second World War Some of these requests were for assistance in the control of venereal syphilis which had become a serious health problem in many areas as a result of the war With the cessation of UNRRA activities this type of aid became the responsibility of WHO and UNICEF which provided technical advisers and consultants and certain supplies and equipment to the Governments of Bulgaria Czechoslovakia Hungary and Poland for syphilis control In some of these countries emphasis was on the control of prenatal and infantile syphilis but in Czechoslovakia and Poland the control measures were of wider scope

One of the first treponematosis control projects in which international assistance was sought was in Poland The Polish health administration undertook a syphilis-control campaign in which penicillin was used for the first time on a mass scale

In 1947 mobile units were established for case finding by mass serological screening examinations and for the health education of the public The entire population of the areas concerned was examined and positive reactors were directed to the nearest health centre for confirmation of the diagnosis From the start of the campaign until the end of August 1948 1 540 000 persons were examined by the Chediak test which was found the most practical for mass screening Of the 1 200 000 persons examined during 1948 alone 21 772 [illegible] positive or doubtful serological find[illegible] 11 066 were confirmed by [illegible]

Patients with early syphilis received 3 4 2 mega units of penicillin in oil beeswax (POB) —the repository preparation available at that time In the early stages of the campaign this treatment was combined with a course of arsenoxide and bismuth Pregnant women received 6 mega units of POB without adjuvant therapy and children with congenital syphilis also received penicillin alone

Four hundred and thirty five physicians 331 nurses and 255 public health nurses and social workers were recruited training courses were open to all physicians in the country

The Polish mass campaign was from the start integrated with the health services which in effect were responsible for the organization of new treatment facilities it also made use of the existing venereal disease clinics local health centres and maternal and child health units

Unfortunately Poland has since 1950 ceased to be an active member of WHO and precise information for evaluating the ultimate success of the campaign has therefore not become available to the Organization The same is true of Bulgaria Czechoslovakia and Hungary from which sufficient data have not been obtained to appraise the actual extent of the work and the results achieved

Finland Greece, Italy

The programmes in Finland Greece and Italy were designed to assist the Governments of these countries in the control of syphilis among pregnant women nursing mothers and infants Equipment and supplies were

provided by UNICEF and consultant services medical literature and fellowships by WHO

In Finland control of prenatal and infantile syphilis formed part of a nationwide venereal disease control campaign which although well organized and operated was restricted owing to economic and technical difficulties International assistance enabled the Government to expand its efforts and to introduce modern methods of treatment and control on a wider scale The proportion of pregnant women serologically examined for syphilis increased from 41/ in 1946 to 92/ in 1951 and the total number of blood specimens examined by the serological laboratories in the country increased from 288 885 in 1949 to 323 135 in 1950 an increase of about 12/ The great majority of syphilitic mothers were hospitalized before delivery for complete physical and serological examinations post natal examinations including X ray studies of mothers and children were carried out at stated intervals Although the specific death rates attributed to syphilis have shown little change a significant reduction took place in infant mortality due to syphilis in the period 1948 51 Despite the considerable decrease in the number of discovered cases of primary and secondary syphilis in the country as a whole venereal disease control activities have not been relaxed it would appear that so long as these efforts continue it is not likely that venereal disease will again be a public health problem of great magnitude This shows how appropriate aid to an already existing and effective venereal disease control programme can sustain and expand public health activities

In Greece and Italy no nationwide venereal disease campaigns were envisaged After visits by WHO consultants it was agreed that limited demonstrations of case finding and of treating prenatal and infantile syphilis with penicillin should be undertaken

In Italy demonstration centres were established in Rome Naples Palermo Messina Catania and Agrigento In the centre at Naples work began in 1948 but activities did not start in the other centres until the early autumn of 1949 By the end of 1950 15 613 serological tests in prenatal syphilis had been carried out and 1 074 in cases of infantile syphilis 2 729 patients had been treated with penicillin 2 181 of whom were pregnant women

In 1950 the Italian Government distributed penicillin to all venereal disease control dispensaries in major towns in Italy

In Greece the Ministry of Health requested WHO/UNICEF assistance in 1949 to control syphilis among pregnant women in Athens Piraeus and Salonica During 1950 and 1951 about 1 510 women and a similar number of congenitally syphilitic children were treated with penicillin In 1950 a demonstration project for treatment of early syphilis in adults was established with WHO assistance in one of the major clinics in Athens

India

A WHO venereal disease demonstration team began work in the Himachal Pradesh in 1949 with the aim of developing venereal disease control on modern lines at reasonable cost and of giving training in diagnosis treatment and control to local staff Laboratory centres for bacteriological and serological procedures in the diagnosis of venereal disease were established and stress was laid on the standardization of serodiagnostic techniques

Treatment schedules were recommended suited to local conditions and the importance of controlling early infection and of preventing congenital syphilis was emphasized Due attention was also paid to the desirability of special research work the compilation of statistical data and the value

of epidemiological investigation and case finding

Training was given in three month courses and the most satisfactory teaching method was found in seminars technical demonstrations were carried out in the clinic the laboratory and the field

During the first year serological surveys were made in many areas in different parts of India Wide variations in seropositivity of from 5% to over 50% of the population groups examined were revealed

A limited mass campaign was undertaken in the Ghund area where the prevalence of syphilis was found to be extremely high and where environmental conditions were such that the project could be subjected to certain controls Altogether about 1 556 persons were tested by the Meinicke and VDRL slide test techniques and 590 persons (38%) were treated in 1949 with 300 000 units of PAM each A sample re examination of 453 persons was made six months later and of 177 after a year

Experience in this small pilot project indicated that large groups of people could be assembled for examination and treatment under extremely difficult field conditions and that if simple slide tests were used laboratory examinations also could be carried out in the field and the results of the serum tests obtained on the same day as the specimens were taken The immediate results of treatment indicated a satisfactory initial decrease in the reservoir of infection and the number of new cases fell significantly [1] At the follow up examinations a considerable lowering in the serological titre was also noticed and the re treatment rate was about 20% A resurvey for epidemiological study is planned for 1955

A demonstration project in progress in southern India is concerned with the strengthening of the facilities for teaching and research at the Venereal Disease Department of the Madras Medical College The clinic there is probably one of the largest in the world total attendance in 1949 amounted to 69 939 men and 20 320 women and children and in 1950 to 66 082 men and 24 131 women and children In both years the number of new cases exceeded 15 000

WHO has supplied a consultant serologist and a public health nurse in addition to laboratory and teaching equipment and a medical social worker has been provided by the United Nations The Madras Government has for its part considerably increased its staff and provided equipment and supplies for the further strengthening of the medical centre

A special laboratory established in the Madras General Hospital participated in the first all Indian serological evaluation programme sponsored by the Indian Council for Medical Research Six national laboratories in different parts of India participated and the Madras laboratory acted as reference centre Inter state evaluation of the tests performed by field laboratories was also organized

Afghanistan

A venereal disease clinic and laboratory working in co operation with maternal and child health services was established in 1950 at Kabul WHO has provided medical advisers and nursing consultants and UNICEF has provided important supplies

Between March 1952 and July 1953 seven medical officers and nine nurses were trained in the venereal disease clinic eight medical officers 24 laboratory technicians and assistants and four nurses were trained in the laboratory Lecture courses have been given to the local midwifery school to student nurses at the maternity hospital and to

[1] Cutler J C., et al. (1952) *Bull Wld Hlth Org* 5 377

medical personnel at the Kabul military establishment

Numerous serological surveys have been undertaken and treatment has been given to patients with positive reactions Home visiting and epidemiological case finding have been encouraged A total of 5 153 persons have been tested and the seropositivity has varied from 31/ among prisoners at Herat to 0 6/ among schoolchildren in different areas

The laboratory has gradually increased its activities from serological testing for syphilis only to include various laboratory examinations of a general character in fact it is currently functioning as an expanded public health laboratory for maternal and child health and other purposes

Ecuador

In Ecuador a small scale demonstration for controlling syphilis by mass PAM treatment has been in operation in the Portoviejo and Manta regions since 1950 Each of these regions has a population of 5 000-6 000 persons between the ages of 15 and 50 years

All persons in this age group whether or not they were infected with syphilis have been given two injections of 1 2 mega units of PAM each at five days interval and a serological test has been made at the time of the first injection the patient being informed of the results at the second injection Treatment has been given in the central clinic at community centres and on a mobile basis by a house to house canvass By this means a mass treatment campaign and a serological survey have been conducted simultaneously

By September 1952 VDRL and Kahn serological tests had been done on 4 762 persons in Portoviejo 404 (8 5/) were positive to both tests Up to March 1953 some 7 223 people had been serologically tested in the campaign in Manta A third campaign was organized in Bahia in May 1953

Egypt

With the help of WHO a demonstration centre was established in 1950 at Tanta between Cairo and Alexandria with the objects of furthering training of medical and auxiliary personnel of standardizing diagnostic and treatment procedures of stimulating interest in the promotion of health education of encouraging case finding epidemiological and other public health methods of carrying out operational research and finally of studying the importance of the venereal-disease problem in the country as a whole It was found that the incidence of syphilis was not as high as had originally been estimated by the health administration The seropositivity among different population groups totalling 29 704 persons varied between 17 3/ and 0 2/

The demonstration centre was later transferred to Cairo where the international staff (a venereologist laboratory physician public health nurse and a health educator) was able to enter into more direct contact with university clinics and to create interest in health education The demonstration team introduced and gained wide acceptance of the use of PAM in syphilotherapy in national clinics throughout the country newer antigens and modern serological methods were also introduced Training courses were organized by the Ministry of Health for doctors nurses and serologists Mobile venereal disease control field units were established

The WHO team left Egypt at the end of 1952 However venereal disease control is going forward and is being extended Thus a mass serological examination of the population of the Siwa oasis in western Egypt was recently made patients and contacts were treated and the epidemiological and socio

logical aspects were studied The population of this oasis is being re examined after six to eight months This is an example of the kind of continuity which WHO seeks to foster when its direct assistance has ceased

Burma

A model venereal disease clinic and laboratory has been in operation in Rangoon since 1951 with WHO and UNICEF assistance The clinic works in co operation with five local venereal disease centres and four venereal disease centres in other areas of the country have been established as part of the project There has also been close co operation with maternal and child welfare centres throughout the country and with a special skin clinic for the treatment of leprosy

Between September 1951 and December 1953 a total of 34 571 cases of syphilis were found among 118 446 patients seen at the main clinic and the outlying clinics including those in Mandalay Moulmein and Pegu A number of special serological surveys have been undertaken in which 39 378 persons were tested The seropositivity varied from 25 4% among Rangoon port workers to 2 4% among Rangoon students

At the Rangoon centre medical officers nurses inspectors laboratory technicians and social workers have been trained by the international staff comprising a venereologist a laboratory expert and a public health nurse In addition, lectures and clinical demonstrations have been given to medical students student nurses health visitors students in public health nursing midwives and other medical or para medical personnel

Ceylon

In 1951 a venereal disease-control project was begun by the health administration of Ceylon with WHO providing the services of a venereologist and a public health nurse It has been estimated that venereal diseases affect more than 10% of the total island population [2]

A model clinic was established in Colombo to start the control of venereal diseases in the city Collaboration is maintained with other medical and public health activities such as maternal and child welfare clinics and blood banks Three local subsidiary clinics and four outstation clinics run by medical officers trained at the main clinic have been set up in different parts of Ceylon Between March 1952 and November 1953 4 013 cases of syphilis were diagnosed among 22 479 patients seen at the central and other clinics Special serological surveys have been conducted on a total of 46 853 persons who showed a seropositivity varying from 11 9% among workers in private tanneries to 0 5% among schoolboys

Since June 1952 a number of medical officers have been trained at the clinic and courses of lectures have been given to doctors postgraduate and undergraduate medical students sanitary inspectors nurses rural leaders and teachers from the training school

Ethiopia

On the basis of recommendations resulting from a WHO survey [3] a central venereal disease clinic and laboratory was established at Addis Ababa in 1952 with the dual function of training national staff and of carrying out mass serological tests and penicillin treatment WHO has furnished a venereologist a serologist and a public health nurse Technicians and auxiliary workers have been trained and will be sent out into the field in secondary teams to carry out mass penicillin treatment under

---

Chelva jah T (1947) *C yl Hlth N ws* 13 1

G the, T (1949) *B ll Wld Hlth O g* 2 85

central supervision The WHO team also helps in work against leprosy

Special epidemiological studies in certain population groups are being carried out in Addis Ababa where the laboratory is performing serological tests on selected groups Serological surveys of 7 080 persons have been made and variations in seropositivity of from 82% among prostitutes in Addis Ababa to 2 3% among schoolchildren have been found

Paraguay

The objective of a campaign in Paraguay which began in 1952 on a limited scale was to determine the prevalence of syphilis in the urban and rural area of Asuncion Villarrica where a seropositivity of about 20% had previously been found and to reduce the incidence of syphilis by modern methods of venereal disease control By November 1953 13 200 persons had been examined and 1 822 (14%) had been treated with single doses of 1 2 mega units of PAM This pilot project will serve as the basis for a nationwide attempt to control venereal diseases

Iran

In Iran WHO is assisting the Government in the establishment of a modern venereal disease-control and laboratory centre at Teheran and in the expansion and improvement of facilities for venereal-disease control in the country as a whole

A three months training course for medical and auxiliary personnel from different provinces started in September 1953 and was attended by 14 doctors 7 laboratory technicians and 27 physician aids The staff trained at the centre will assist the Government in the initiation of venereal disease control in other cities and in rural areas of the country

As in other projects of this nature advice is being given by a WHO venereologist serologist and public health nurse

Pakistan

In West Pakistan efforts are being made to extend the existing venereal-disease-control facilities in and around Karachi making new methods of treatment available to the local population of that city and to national and foreign merchant seamen A fine modern clinic centre has recently been opened which will also be used as a training centre for national technical and professional staff A WHO venereologist serologist and public health nurse have been attached to this centre

Among 9 484 patients seen at the Karachi centre between May and December 1953 there were 809 cases of syphilis (8 5%)

As in all such operations the project is the responsibility of the national Government which will establish smaller venereal disease-control units in other parts of the country These centres will be run by persons trained at Karachi It is expected that these activities will later be expanded and a venereal disease centre is planned for Chittagong East Pakistan in 1955

Saudi Arabia

A venereal disease demonstration has been in operation at Mecca since 1952 with the assistance of a WHO venereologist and a serologist Serological surveys conducted on 10 273 persons have shown a variation in seropositivity of from 33 4% in the armed forces to 8% among schoolchildren

The object of the work has been to set up a clinic and a laboratory from which an investigation into the epidemiology of syphilis and other venereal infections in different parts of the country may be conducted and where technical staff may be trained It has been found that syphilis in certain areas of Saudi Arabia is of the endemic type similar to that found in Bosnia Yugoslavia

logical aspects were studied The population of this oasis is being re examined after six to eight months This is an example of the kind of continuity which WHO seeks to foster when its direct assistance has ceased

Burma

A model venereal disease clinic and laboratory has been in operation in Rangoon since 1951 with WHO and UNICEF assistance The clinic works in co operation with five local venereal disease centres and four venereal disease centres in other areas of the country have been established as part of the project There has also been close co operation with maternal and child welfare centres throughout the country and with a special skin clinic for the treatment of leprosy

Between September 1951 and December 1953 a total of 34 571 cases of syphilis were found among 118 446 patients seen at the main clinic and the outlying clinics including those in Mandalay Moulmein and Pegu A number of special serological surveys have been undertaken in which 39 378 persons were tested The seropositivity varied from 25 4% among Rangoon port workers to 2 4% among Rangoon students

At the Rangoon centre medical officers nurses inspectors laboratory technicians and social workers have been trained by the international staff comprising a venereologist a laboratory expert and a public health nurse In addition lectures and clinical demonstrations have been given to medical students student nurses health visitors students in public health nursing midwives and other medical or para medical personnel

Ceylon

In 1951 a venereal disease-control project was begun by the health administration of Ceylon with WHO providing the services of a venereologist and a public health nurse It has been estimated that venereal diseases affect more than 10% of the total island population [2]

A model clinic was established in Colombo to start the control of venereal diseases in the city Collaboration is maintained with other medical and public health activities such as maternal and child welfare clinics and blood banks Three local subsidiary clinics and four outstation clinics run by medical officers trained at the main clinic have been set up in different parts of Ceylon Between March 1952 and November 1953 4 013 cases of syphilis were diagnosed among 22 479 patients seen at the central and other clinics Special serological surveys have been conducted on a total of 46 853 persons who showed a seropositivity varying from 11 9% among workers in private tanneries to 0 5% among schoolboys

Since June 1952 a number of medical officers have been trained at the clinic and courses of lectures have been given to doctors postgraduate and undergraduate medical students sanitary inspectors nurses rural leaders and teachers from the training school

Ethiopia

On the basis of recommendations resulting from a WHO survey [3] a central venereal disease clinic and laboratory was established at Addis Ababa in 1952 with the dual function of training national staff and of carrying out mass serological tests and penicillin treatment WHO has furnished a venereologist a serologist and a public health nurse Technicians and auxiliary workers have been trained and will be sent out into the field in secondary teams to carry out mass penicillin treatment under

Chel a j h, T (1947) *C ylon Hlth N w* 13 1
G the T (1949) *B ll Wld Hl h Org* 2 85

TABLE VI ENDEMIC SYPHILIS EARLY INFECTIOUS LESIONS AND SEROPOSITIVITY OBSERVED IN FOUR SURVEYS IN MNO SAPNA BOSNIA 1949-52

Ar a	Mean popu lat on	Ea ly Infect ous les ons								Seropos t ity							
		number of cases				/ of m a populatio				umber of cases				of mean populat on			
		survey No				s rvey No				surve/ No				survey No			
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
1 Kraljevići	418	30	1	1	0	7 2	0 2	0	0	1.0	64	8	3	31 1	15 3	1 9	0 7
2. Ram ći	313	29	7	5	0	9 3	2 2	1 6	0	103	57	17	5	3 9	1 ..	5 4	1 6
3 Medjedja	356	24	4	3	0	6 7	1 1	0 8	0	212	116	97	8	9 6	32 6	27	2 2
4 Goduš	3.4	16	1		0	4 5	0 3	0 6	0	70	46	14	3	19 8	13.0	4 0	0 8
5 Sapna	495	10	0	7	0	2 0	0	1 4	0	85	41	24	10	17 2	8 3	4 8	2 0
6. Andj ić	273	7	0	0	0	2 6	0	0	0	78	˜6	5	3	28 6	9 5	1 8	1 1
7 Mahmutov ći	225	7	0	0	0	3 1	0	0	0	44	18	1	1	19 6	8 0	0 4	0 4
8. Ko ačevići	307	7	4	4	0	2 3	1 3	1 3	0	.4	31	7	2	17 6	10 1	2.3	0 7
9 M Nezuk	416	5	0	0	0	1 2	0	0	0	97	57	15	12	23 3	13 7	3 6	2 9
10 Jus ć	195	1	0	0	0	0 5	0	0	0	23	12	3	0	11 8	6 2	1.5	0
Total	*3,352*	*136*	*17*	*22*	*0*	*4 1*	*0 5*	*0 7*	*0*	*896*	*4°8*	*191*	*47*	*26 7*	*14.0*	*5 7*	*1 4*

M o is a sm ll admi istrati e nit. The total a ea of Mno S p a is 125 sq a e k lomet es (48 sq a e m les) 94.5 of the mean total popul t o was examined

The four survey were carried out on the followi g dates I 2 October 1949 II 4 Ap il 1950 III 30 June 1951 IV 10 Jan ary 1952 D i g each s rvey the cases found were t eat d In survey III household contacts were also t eated

the entire population was examined at the first survey and when treatment was given to all household and family contacts The abortive treatment of such contacts consisted of single injections of 1 2 mega units of PAM

The gradual decline in the numbers of early infectious cases and in seropositivity is well illustrated in table VI and fig 18

The valuable experience gained in this programme has been described by its director Dr E I Grin [4] who points out

The reservoir as a whole has been brought under control, and the attitude of the people to the problem has been altered this is due partly to some general improvement in the social and economic conditions partly to the work of the field teams and to the general progress of the campaign and partly to the fact that new cases of endemic syphilis are now detected more rapidly and can be more quickly dealt with

"The epidemiological situation cannot conceivably return to its original form after one or two follow up examinations have been made but constant super vision of previously endemic areas is necessary as part of the long term programme In Bosnia such supervision and health control are provided by one or more health workers remaining in the field between control examinations and after the field campaign proper has come to an end. Being selected from the field teams they are familiar with endemic syphilis as a rural health problem in all its aspects The *health workers co-operate with the local health* centres which assume the responsibility for keeping the disease under control through their normal machinery against communicable diseases in the consolidation phase of the long term programme

"The present programme is serving as a bridgehead to the development of general public health services and to the expansion of the machinery against com municable diseases "

---

[4] Grin E. I (1953) *Epidemi l gy nd t l f ndemi yph lis port mass-t tme ampaig in Bo ia,* Geneva (*W ld H al h O ganizati Monog ph S i* N 11) pp 75 78

Taiwan

A demonstration project was initiated in Taiwan in 1953 with WHO and UNICEF assistance This project seeks to provide venereal disease control services for all preg nant women and for children and ultimate ly to establish an islandwide venereal disease control programme including a special port demonstration

Surveys will be carried out in order to assess the extent of the problem in Taiwan for example a serological survey of 1 660 teachers is at present in progress The existing laboratory services will be strength ened and laboratory techniques standard ized Local staff is being trained by a team of national and international advisers and health education is being emphasized The main demonstration centre is at the pro vincial hospital in Taipeh

ENDEMIC SYPHILIS IN BOSNIA

There is historical evidence that syphilis was introduced into Bosnia by the Ottoman armies in the 18th century By the end of the 19th century the disease was already wide spread both in Bosnia and in Herzegovina Owing to unhygienic living conditions low educational and economic standards and certain social customs such as the common use of drinking vessels the disease became endemic

Investigations undertaken in Bosnia during the years 1905 11 indicated a prevalence of 8 3% and a study carried out between 1926 and 1933 gave a figure of 11 8% Before 1948 attempts to control endemic syphilis with neoarsphenamines were unsuccessful In that year the Yugoslav health administration initiated a nationwide syphilis control pro gramme paying special attention to endemic syphilis in Bosnia and requested the assist ance of WHO and UNICEF The approach to the problem was governed by the realiza tion that if the campaign against endemic syphilis was to succeed fully it must accom pany measures to improve the standards of education and health in general

In this campaign a systematic serological screening was undertaken in which approx imately 435 000 persons or 95% of the total census population of the endemic areas were examined In all more than a million examinations and re examinations were made By the end of 1952 35 238 persons 8 1% of the examined population had been treated with penicillin

The campaign directed from a central headquarters in Sarajevo was carried out by three field groups each composed of several teams in co operation with the local health officers of the districts being covered During the early days of the campaign infectious cases were treated with PAM adults receiving a total of 3 6 4 2 mega units in six or seven injections given daily or every other day Later the total dosage was given in a single injection and no difference was observed in the results Finally single injections of 1 8 mega units were used in a number of areas

Although at the beginning it was felt that the greatest danger to the success of the campaign was the risk of relapses it soon became apparent that this was negligible in comparison to the reinfections that occurred and the reactivation of endemic foci from cases that were missed absent or in the incubation period at the time of the first survey The need for resurveys in which the entire population was again examined became evident The best results were obtained when



Third survey June 1951

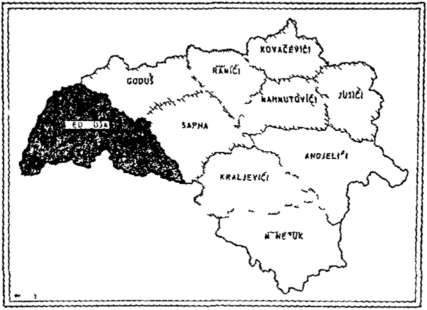


Fourth survey January 1952

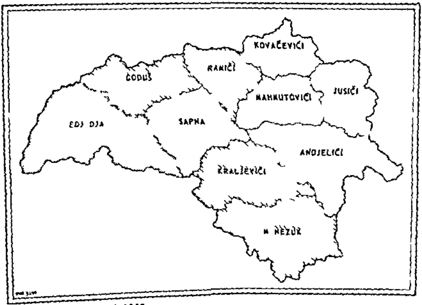
/ *Seroreacto s*

0 4–10 1 | 23 3–28 6 | 59 6
11 8–19 8 | 31 1–32 9

FIG 18 DECREASING PERCENTAGL OF SEROREACTORS FOLLOWING MASS TREATMENT CAMPAIGN AGAINST ENDEMIC SYPHILIS IN BOSNIA *



First survey October 1949



Second survey April 1950

% Seroreactors

0 4-10 1
11 8-19 8
23.3 29 6
31 1-32.9
59 6

* See tabl VI p 43

These are satisfactory conclusions and they indicate

(*a*) that a treponematosis can be brought under control by means of mass treatment with penicillin if suitably applied

(*b*) that a programme to combat endemic syphilis itself stimulates social advancement which in turn renders the environment unsympathetic to the return of the disease and

(*c*) that a treponematosis project can serve as a bridgehead for future public health activity

It is believed that the campaign in Bosnia not only is to the considerable credit of the local health administration but also has been one in which most useful experience has been gained for application in the management of other mass campaigns of which it has been in its way the prototype

---

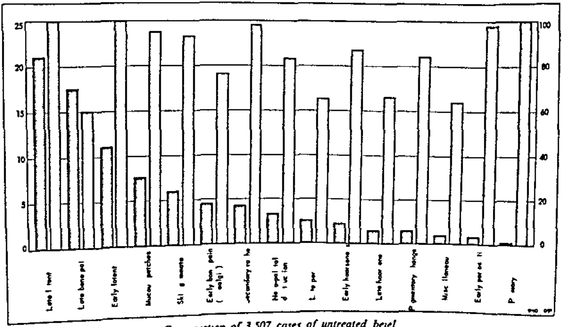
BEJEL AND DICHUCHWA

Bejel in Iraq

In Iraq treponematosis-control activities are centred on bejel the syphilis like disease described by Hudson[5] in 1928 A joint WHO/UNICEF aided demonstration in bejel control was initiated in 1950 An area in the Ramadi region north of Baghdad was first selected for study later surveys were undertaken in the Mosul region in the north the Amara region in the south and subsequently in other areas It became apparent that the disease was not so widespread as had first been feared and that it occurred most frequently in the river bed areas and particu

[5] Hudson E. H (1928) *Nav med Bull (Wash)* 26 817

FIG 19 PERCENTAGE DISTRIBUTION OF CLINICAL SYMPTOMS AND SEROPOSITIVITY IN BEJEL



Cross section of 3,507 cases of untreated bejel

☐ / *of total patients with particular symptom (scale on left clinical symptoms)*

☐ / *seroreactors (scale on right seroreactors)*

larly among the marsh Arabs of Amara where the difficulties of transport were greatest and the people therefore most isolated

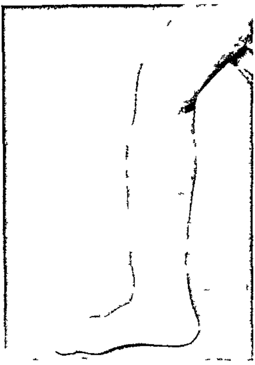
The areas where bejel is prevalent have been the site of a mass campaign of treatment with penicillin By the end of December 1953 more than 134 000 persons had been exam ined and more than 78 000 cases and contacts treated Progress in this campaign has been less rapid than in similar WHO/UNICEF assisted projects partly because the popula tion is widely scattered and because the

FIG 20 EARLY BEJEL



General papi lar eruption in woman three weeks pregnant This patient was treated with 1 2 mega units of PAM and at term delivered a healthy sero-negati e child (G C nk Lo d)

FIG 21 LATE BEJEL



In late stages of the treponematoses there may be painful osteoperiostitis as illustrated above in a case of bejel (G Cs ka, Lond)

facilities for communication and transporta tion in the areas of high prevalence are limited

As has been indicated on page 16 there is great similarity in the epidemiology and in clinical manifestations of bejel and endemic syphilis The late lesions are comparable to the gummata osteoperiostitis and nasal laryngeal and palatal lesions of benign tertiary syphilis A cross section of 3 507 cases of untreated bejel confirms this view [6] and is illustrated in fig 19

Bejel lesions observed in Iraq are shown in fig 20 and 21 Other examples including one of extreme mutilation have been de scribed by Jones [7]

Csonka, G (1953) *B I J* *Dis* 29 95
J es L. G G (1953) *B lt J* *Dis* 29 104

These are satisfactory conclusions and they indicate

(*a*) that a treponematosis can be brought under control by means of mass treatment with penicillin if suitably applied

(*b*) that a programme to combat endemic syphilis itself stimulates social advancement which in turn renders the environment unsympathetic to the return of the disease and

(*c*) that a treponematosis project can serve as a bridgehead for future public health activity

It is believed that the campaign in Bosnia not only is to the considerable credit of the local health administration, but also has been one in which most useful experience has been gained for application in the management of other mass campaigns of which it has been in its way the prototype

---

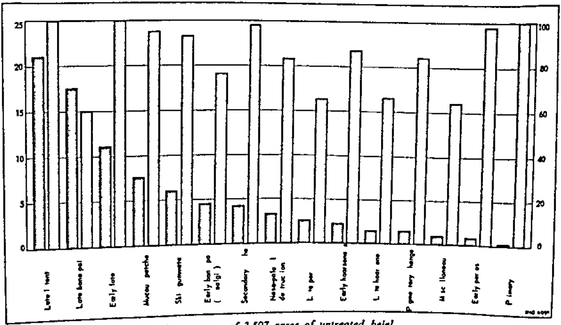
BEJEL AND DICHUCHWA

Bejel in Iraq

In Iraq treponematosis control activities are centred on bejel the syphilis like disease described by Hudson[5] in 1928 A joint WHO/UNICEF aided demonstration in bejel control was initiated in 1950 An area in the Ramadi region north of Baghdad was first selected for study later surveys were undertaken in the Mosul region in the north the Amara region in the south and subsequently in other areas It became apparent that the disease was not so widespread as had first been feared and that it occurred most frequently in the river bed areas and particu

Hudson, E H (19.8) *N m d Bull (Wash)* 26 817

FIG 19 PERCENTAGE DISTRIBUTION OF CLINICAL SYMPTOMS AND SEROPOSITIVITY IN BEJEL



Cross section of 3,507 cases of untreated bejel

/ of total patients with particular symptom (scale on left clinical symptoms)

/ seroreactors (scale on right seroreactors)

MASS CAMPAIGNS AGAINST YAWS

Haiti

Of 3 5 million people living in the Republic of Haiti approximately five out of six live in underdeveloped rural areas where yaws has for some time been rampant Although it is difficult to estimate the pre valence of the disease in the past it is thought that approximately 1 5 million people had yaws a few years ago

In 1941 on the request of the Government of Haiti to the Pan American Sanitary Bureau a yaws survey was made and plans put forward for the control of the disease Early in 1942 a limited programme based on treatment at stationary clinics was started jointly by the Government of Haiti and the Institute of Inter American Affairs At first metal chemotherapy was used but later penicillin was substituted after a demonstra tion of the excellent effects of penicillin in oil and beeswax [8]

In 1948 the United Nations Mission of Technical Assistance to the Republic of Haiti recommended that an organized nation wide mass campaign with penicillin be under taken This proposal was considered by the WHO Expert Committee on Venereal Infec tions in 1949 [9] which recommended that in the Republic of Haiti and the Dominican Republic an epidemiological experiment be carried out with simple mass techniques and using procaine penicillin in oil with aluminium monostearate (PAM)

The present campaign began in July 1950 with a team of WHO technical advisers and UNICEF supplies and has been in continu ous operation since that time The simplest methods have been used throughout As medical staff is limited mass treatment has been carried out by rapidly trained auxiliary personnel and local inspectors who are also qualified chauffeur mechanics have performed the bulk of the work These "injectors" *have given treatment to everybody* regard less of age or clinical or anamnestic evidence of yaws Satisfactory results have been obtained by giving 600 000 units of PAM to yaws cases those without clinical manifesta tions or history of the disease have received only 300 000 units and children and infants have been given proportionately smaller doses

By the autumn of 1951 666 738 persons had been treated in clinics When the first census figures became available however it was found that an insufficient percentage of the population was being reached and a change was made to a house to house method of treatment in which each person seen was given an injection of penicillin *in the same doses as before* With this method 1 700 240 persons (about 97% of the popula tion of the new areas covered) were treated between October 1951 and September 1953 Sample surveys carried out in these areas eight months after treatment showed that the initial knock down had been satis factory very few cases of infectious yaws were found On the other hand in the areas that relied on the fixed clinic system and where substandard penicillin had been used in some cases isolated foci of infection persisted and some of them had already begun to expand It has therefore become necessary to revisit each house in these areas treating all persons regardless of presence or absence of the disease with a satisfactory *penicillin*

There is a substantial focus of venereal syphilis in the urban area in and around

---

[8] Dwinell J H Sh ld n, A. J R in, C R & Sternberg T H. (1947) *Amer J t p M d* 27 633

[9] *W ld Hlth O g t hn. R p S* 1950 13 16

FIG 22 EFFECTIVENESS OF PENICILLIN IN BEJEL



Even in far-advanced late cases of bejel the infection may be arrested by a single injection of long-acting penicillin as shown in the above photographs Left before treatment right three weeks after one injection of 2 4 mega units of PAM

(L G O Jones Lo do)

Dichuchwa in Bechuanaland

It has already been mentioned that dichuchwa a treponematosis similar to or identical with endemic syphilis and bejel is encountered in some parts of Africa A joint WHO/UNICEF programme to control this infection was initiated in Bechuanaland in November 1953

Field operations during the first year of the project are being limited to a study of the epidemiological clinical and serological aspects of the infection including the response to treatment of cases and contacts The Bakwena Reserve which is occupied by the 40 000 members of the Bakwena tribe has been selected for the preliminary investigations control and follow up measures are being undertaken on a family basis Treatment is being given to all active cases of treponemal diseases to all latent cases (as determined by anamnesis) and to the contacts of infectious cases Contacts have been defined as all adults in the same house and all children under the age of 16 years in the same kraal as any infectious case

In November and December 1953 5 000 persons were examined Information obtained thus far will form the basis for a mass treatment campaign which will begin with UNICEF assistance towards the end of 1954

A WHO/UNICEF assisted campaign began in April 1950 The campaign is being carried out by mobile teams composed of one medical officer and usually four auxiliary workers 17 regular teams and three follow up teams are at present at work A WHO team of advisers is assisting the national health administration

Until the end of October 1952 the treatment consisted of two injections of 1 2 mega units of PAM each Since that time single injections of 1 2 1 8 mega units of PAM have been given The Government has supplied one third of the penicillin and UNICEF two thirds

Where the prevalence of yaws is 15% or over or where there is a high proportion of infectious cases the treatment of contacts has been extended to include not only household contacts but also all contacts in the same class at school as children found to have infectious yaws Resurveys are being undertaken in the treated areas

In the three and a half years up to November 1953 a total of 2 581 879 persons had been examined (first examination) 317 692 had been treated for the first time and 6 391 re treated About 34 093 of the treated cases were discovered at resurvey It was planned that about 750 000 people were to be examined in the second half of 1953 and 1 750 000 in 1954 At the present rate of progress the work will continue for the next three to five years Approximately 54% of the cost is borne by the Government and 46% by UNICEF

Philippines

The Philippine archipelago consists of 7 021 islands with a total population of about 20 million of whom three quarters live in rural areas Yaws is reported to be endemic in 39 of the 51 provinces in 30 of these the prevalence is reported to be less than 1% but in the remaining nine the average prevalence is 3 6% and reaches 30% in certain areas The disease is most common on the smaller islands along the sea coast along rivers and in the swampy regions of the larger islands

The Philippine Government assisted by WHO and UNICEF began a yaws-control campaign in April 1951 in the nine provinces with the highest prevalence The campaign was started in the island provinces of Samar and Leyte where the prevalence was believed to be about 8% among the rural population There are altogether six mobile teams which travel from village to village the population is told in advance when the team will arrive and a census is taken Local sanitary inspectors and other health personnel work with the team and are given training in yaws control As the teams move on the records are left behind in the charge of the president of the sanitary division who arranges for the follow up of those treated In this manner the campaign becomes integrated into the public health structure of the province

Treatment was originally given by injections of 0 6 mega units of PAM for children under ten years of age and two injections of 1 2 mega units each for adults These doses were changed to accord with recommendations made at the First International Symposium on Yaws Control which was held in Bangkok in 1952 A single injection procedure is now being used Up to December 1953 1 880 867 persons had been examined and 71 783 treated with penicillin

Resurveys of the control areas and of all areas in which the prevalence exceeded 10% have been carried out by two teams The results of one resurvey showed a prevalence of 2 48% in a population of 16 000 persons as compared with 18% at the first survey

India

There are pockets of yaws in India in parts of the Madhya Pradesh and adjoining States

Port au Prince and measures against it before the Haiti programme is completed are being considered

Haiti is only one part of an island shared by the Dominican Republic It is clear therefore that the eradication of yaws will be difficult unless control efforts are under taken in the border areas of the Dominican Republic as well and steps to this end are under consideration

Indonesia

The population of Indonesia is estimated at 75 million the vast majority living in rural areas It has been stated that there are about 10 million cases of yaws in the country

Active yaws work was carried out with arsenicals in Indonesia before the Second World War but during the war control measures were discontinued and a sharp rise in the incidence of the disease took place Plans for the control of yaws with the help of WHO and UNICEF were drawn up by the Indonesian Government and WHO consultants and the work began in May 1950 Starting with two areas in the residen cies of Jakarta and Jogjakarta the operations have since been extended to west Java Bali and Flores north Sumatra and South and West Kalimantan (Borneo)

The campaign is based on teams of six or eight trained nurses working under the supervision of full time and part time medical officers Owing to the shortage of personnel a scheme has been introduced by which 200 assistant nurses working in dispensaries under the supervision of the trained nurses are being instructed in the diagnosis and treatment of yaws Early in 1953 there were 24 regular mass treatment teams and 35 simplified teams in the field These teams examine the entire populations of villages and all patients with active yaws are asked to report to a site where the diagnosis is checked and treatment administered

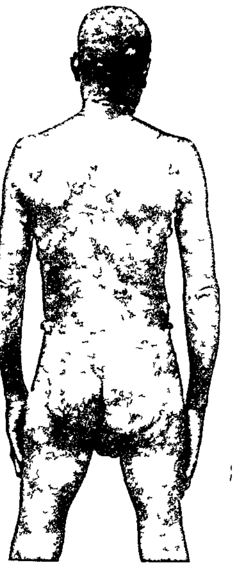
The campaign as a whole is run from headquarters at Jogjakarta from which several important pilot studies have been carried out to determine the efficacy of various treatment schedules and methods of approach to the communities A study is also being made of the efficacy of diamine penicillin under tropical conditions

At the beginning of the campaign adults were treated with two injections of 1 2 mega units of PAM each given at intervals of from four to seven days smaller doses were given to children Recently single injections of 1 8 mega units have been given It is now accepted in principle that the treatment of apparently non infected house and school contacts with half this dosage is necessary To date however comparatively few con tacts have been treated

In all a total of 6 745 515 persons had been examined and 1 079 224 treated up to the end of 1953 No fewer than 73 205 per sons were treated for the first time during resurveys indicating the necessity of re examining the total population on these occasions The populations covered have frequently reached the desired level of 90%

Thailand

Of the 18 3 million people in Thailand it is estimated that approximately 60% or about 11 million live in areas where yaws is found From surveys of these areas it is estimated that there may be about 1 430 000 cases of yaws The distribution of the disease is patchy but here as elsewhere it is associated with remoteness filth and low standards of personal hygiene Previously arsenicals were administered at a few station ary rural clinics but as in other parts of the world they had little or no effect in controlling the disease



Generalized multiple papillomata
(F N Guimarães Rio de Janeiro)

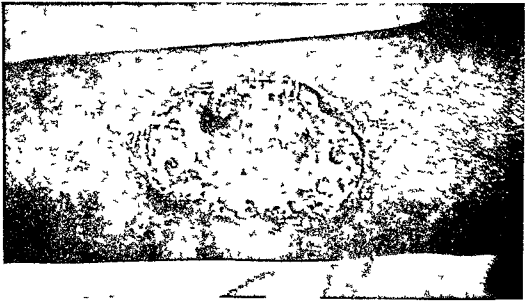


Gross gangosa (rhinopharyngitis mutilans)
(C J Hackett London)



Incapacitating plantar hyper keratotic lesions
(F N Guimarães Rio de Janeiro)

FIG 23 LESIONS OF YAWS



Indolent ulceration of the elbow (C J Hack tt Lond n)



Juxta-articular nodules in patellar region
C. J Hackett, London)



Bone deformation in tertiary yaws
(E E. Kruizi ga, Rij w jk Netherland)

national Refugee Organization (IRO) and WHO

Refugees still present a problem in many parts of the world More than 850 000 Arabs have been living for some years in camps in Lebanon Syria the Hashemite Kingdom of the Jordan and the Gaza area of Israel As part of the international aid which they receive considerable attention is paid to the improvement of maternal and child health and to the control of communicable diseases including syphilis

A serological survey carried out in 1950-51 among 8 259 pregnant women in Lebanon Syria and Gaza showed that 5 3/ of them were serologically positive for syphilis WHO arranged for these women to be treated with penicillin and undertook the necessary measures for the general control of syphilis At the same time the Organization took steps to ensure that the laboratory procedures used in the diagnosis of cases were of the highest standard

Other refugees—for example those displaced by the partition of India and lodged in camps in Pakistan—have been assisted through demonstration centres established with international assistance

Migrants

Consultations have taken place between the International Labour Organisation (ILO) IRO and WHO on the medical requirements of various countries which have been or are accepting immigrants and on the requirements as to persons who have been treated for syphilis Countries that accept immigrant labour have different medical requirements and it is desirable to ensure that persons emigrating from one country to another are not turned back on arrival because of those differences

In the days before penicillin persons with positive serological tests for syphilis (excluding those with biological false positive reactions) were often considered ineligible as immigrants However new and effective methods of treatment with penicillin and the realization that a positive serological test does not always mean active syphilis in adequately treated persons with a negative spinal fluid have led several nations to change their regulations This change fostered in part by WHO has brought hope to thousands of persons in desperate situations who were hitherto automatically precluded from emigration to new countries

Seafarers

The historical importance of seafarers in the dissemination of syphilis has been appreciated since the time of the classical epidemic of syphilis which spread through Europe after the return of Columbus from the New World The development of the steamship in the 19th century and the realization of its potential in the 20th century gave rise to much concern about the spread of venereal diseases by seafarers This resulted in the Brussels Agreement of 1924 which provided for free treatment in the major ports for seafarers suffering from venereal infections Fifty seven countries and their overseas territories have adhered to this Agreement which was established on the initiative of the Red Cross the International Union against Venereal Diseases and the International Labour Organisation WHO took over the administration of the Agreement from the Office International d Hygiène Publique in 1948

Because of the striking changes in the nature and extent of the treatment of syphilis and other venereal infections WHO on the recommendation of the First Health Assembly [10] assumed the responsibility for studying the possibility of revising the Brussels Agreement with a view to establishing WHO

[10] *Off R Wld Hlth O g* 1948 13 303

An active campaign undertaken by the State Government of Madhya Pradesh in the years 1941-45 was successful in reducing the incidence of the disease but financial stringency brought it to an end and the incidence has since increased

A campaign to stamp out yaws from this area has now begun with WHO and UNICEF assistance It started as a pilot project in the Madhya Pradesh and was extended to the State of Hyderabad in July 1953 it is proposed to extend it later to the other adjoining States Up to November 1953 85% of the total population of 79 813 persons in 556 villages had been examined 3 789 cases of yaws (5 6%) had been found and persons with lesions or a history of yaws and contacts of infectious cases had been treated

Laos

The population of Laos is estimated at 1 5 million in the four southern provinces with a population of 610 000 the estimated prevalence of yaws in some areas is between 10% and 15% Conditions of security and communications allow approximately 60% of the population in the south to be reached by jeep but only in the dry season

Previously yaws cases were treated with arsenicals at stationary clinics but a project for survey training and mass treatment is now under way conducted with international assistance by one mobile team Since April 1953 97 212 persons have been examined and 5 821 persons including 829 contacts treated with penicillin

Liberia

In Liberia where the population is about 1 5 million malaria and yaws are the main public health problems It is estimated that approximately 30% of the population are afflicted with yaws Even in the capital Monrovia there is a reported prevalence of 16% to 19%

With international assistance a survey of a population of 50 000 was begun in March 1953 in the vicinity of Ganta where malaria is also very prevalent A house to-house survey of the Kpaing area began in August 1953 and resurveys will take place at intervals of six months These surveys will be combined with antimalaria activities All clinical cases found will be treated with penicillin and contacts will receive preventive doses In the Bahn area field surveys have so far been undertaken in 16 villages where 4 918 persons have been examined of whom 63 9% were found to have yaws

Up to December 1953 14 846 persons had been examined and 10 840 treated (including contacts) in this project

SYPHILIS CONTROL IN SPECIAL POPULATION-GROUPS

Certain population groups require consideration as units although their individual members may come from many countries Among such groups are refugees migrants and seafarers

Refugees

The problem of refugees was at its height immediately after the Second World War The need for controlling venereal diseases particularly syphilis in vast groups in Europe and Asia was recognized at the time and the importance of reducing congenital syphilis was included in the plans for the maternal and child health activities of the international organizations Work to this end was undertaken in Europe first by UNRRA and later by the former Inter

risen by 10% since 1946 and is now according to the Lloyds Register for 1952 a total of 90 868 495 gross tons In the light of this steady increase in tonnage and in floating population the problem of venereal diseases is likely to hold the interest of maritime nations throughout the world and health administrations may wish further international action with regard to this truly international problem

---

INTERNATIONAL EXCHANGE OF TECHNICAL INFORMATION

The exchange of technical information is of immense value to countries and its promotion and execution are therefore a basic function of WHO In effect the Organization acts as an international clearing house for this purpose It is essential that the latest information on progress in the prevention diagnosis treatment and other aspects of treponematosis control be made available to all interested countries so that control activities may be in step with the march of events Much information is always obtainable from current medical literature but the programmes of health administrations and of WHO yield important data which can best be made known through the Organization In addition as a result of its operational studies and as a co-ordinator of international research WHO is an important source of knowledge on specific subjects of wide interest

Expert Committees and Advisory Panels

In recommending technical policies as well as in advising governments on measures concerning treponematosis control WHO must be able to call upon the technical advice of persons who are not only most competent in their field but also representative of the newest trends and of as wide a geographical distribution as possible This last consideration is in line with the international character of the Organization it also serves another important purpose experience has demonstrated that methods of combating a disease that may be efficient and effective in one country may have little practical value as long as they are not tested and accepted by other countries with similar problems It is therefore essential when drawing up overall plans for control of a disease to have the benefit of expert views representative at the same time of various technical aspects and of national methods of control It is principally for this purpose that WHO has established a series of expert advisory panels each concerned with specific problems

Technical guidance in WHO s treponematoses activities is provided by an Expert Advisory Panel on Venereal Infections and Treponematoses the members of which are appointed by the Director General because of their competence in this particular branch of medicine and by expert committees the members of which are drawn from the panel and the composition of which varies according to the subject chosen for consideration at a particular committee session At the present time WHO has an expert advisory panel of 73 members from 44 countries upon whose technical knowledge and experience in the treponematoses it may draw

Four expert committee meetings have been held—two in 1948 and one each in 1949 and 1952 A Subcommittee on Serology and Laboratory Aspects has also held three sessions—in 1949 1950 and 1953 The tech

health regulations in this field similar in principle to those for quarantinable or pestilential diseases No definite steps were taken until the pattern of the new international regulations with regard to other diseases should become clear with the coming into force of the International Sanitary Regulations in 1952 In the meantime on the suggestion of the International Union against Venereal Diseases the Netherlands Government established the Rotterdam Port Demonstration Centre with the assistance of WHO Among the activities of the Centre is the study of certain aspects of maritime venereal disease control and of the functioning of the Brussels Agreement

The control of venereal disease among seafarers and the place of venereal infections in maritime public health in general were also considered by the Joint ILO/WHO Committee on the Hygiene of Seafarers in 1949 [11] and will be studied again when this committee meets in April 1954 It is expected that the legal aspects of the Brussels Agreement will be considered by WHO in 1955 and that a study of the proposed WHO health regulations will subsequently be transmitted to governments and to the interested international organizations

WHO has published a revised edition of the *International list of venereal disease treatment centres at ports* which gives venereal disease clinics in the major ports throughout the world and the hours of attendance A further edition is due in 1955 Similarly the individual treatment record booklet issued under the Brussels Agreement has been revised and brought up to date

In its role as administrator of the Agreement WHO receives complaints from health administrations about services in ports and acts as intermediary between the governments concerned The exchange of epidemiological information is also encouraged

WHO was instrumental through its headquarters and its Regional Office for Europe in the establishment of the International Anti Venereal Disease Commission of the Rhine an intergovernmental body on which were represented the five countries sharing the Rhine River system

Finally WHO sometimes assists governments directly in the establishment of port treatment facilities for venereal infections e g in Karachi Pakistan

The technical interest of WHO in maritime venereal disease control has been in fostering standardized methods of diagnosis and therapy among seafarers so as to obtain more uniform treatment schedules and serological tests at ports in different countries Although wide variations still exist the introduction of penicillin therapy in syphilis has greatly simplified the previously complicated situation resulting from the need to retain seafarers for prolonged treatment ashore with metal chemotherapy The facts that penicillin treatment of early syphilis requires only a few sessions and that the patient need not be hospitalized have substantially reduced absenteeism and the number of man days lost in home and foreign ports which is an economic gain for the employer and employee alike and for the government concerned But new problems have arisen because of the comparative ease with which crews have access on board ship to penicillin given parenterally or orally for therapeutic and prophylactic purposes this has made post treatment control and follow up more complicated

The problem of immediate importance in maritime venereal disease control is early syphilis In some maritime countries the incidence of early syphilis has been less noticeable in port than in inland areas but on the other hand increasingly important ports in underdeveloped areas remain very real foci of infection at a time when the tonnage of post war merchant fleets has

---

[11] *Wld Hlth Org techn Rep Ser* 1950 20

risen by 10/ since 1946 and is now according to the Lloyds Register for 1952 a total of 90 868 495 gross tons In the light of this steady increase in tonnage and in floating population the problem of venereal diseases is likely to hold the interest of maritime nations throughout the world and health administrations may wish further international action with regard to this truly international problem

---

INTERNATIONAL EXCHANGE OF TECHNICAL INFORMATION

The exchange of technical information is of immense value to countries and its promotion and execution are therefore a basic function of WHO In effect the Organization acts as an international clearing house for this purpose It is essential that the latest information on progress in the prevention diagnosis treatment and other aspects of treponematosis control be made available to all interested countries so that control activities may be in step with the march of events Much information is always obtainable from current medical literature but the programmes of health administrations and of WHO yield important data which can best be made known through the Organization In addition as a result of its operational studies and as a co ordinator of international research WHO is an important source of knowledge on specific subjects of wide interest.

Expert Committees and Advisory Panels

In recommending technical policies as well as in advising governments on measures concerning treponematosis control WHO must be able to call upon the technical advice of persons who are not only most competent in their field but also representative of the newest trends and of as wide a geographical distribution as possible This last consideration is in line with the international character of the Organization it also serves another important purpose experience has demonstrated that methods of combating a disease that may be efficient and effective in one country may have little practical value as long as they are not tested and accepted by other countries with similar problems It is therefore essential when drawing up overall plans for control of a disease to have the benefit of expert views representative at the same time of various technical aspects and of national methods of control It is principally for this purpose that WHO has established a series of expert advisory panels each concerned with specific problems

Technical guidance in WHO s treponematoses activities is provided by an Expert Advisory Panel on Venereal Infections and Treponematoses the members of which are appointed by the Director General because of their competence in this particular branch of medicine and by expert committees the members of which are drawn from the panel and the composition of which varies according to the subject chosen for consideration at a particular committee session At the present time WHO has an expert advisory panel of 73 members from 44 countries upon whose technical knowledge and experience in the treponematoses it may draw

Four expert committee meetings have been held—two in 1948 and one each in 1949 and 1952 A Subcommittee on Serology and Laboratory Aspects has also held three sessions—in 1949 1950 and 1953 The tech

health regulations in this field similar in principle to those for quarantinable or pestilential diseases No definite steps were taken until the pattern of the new international regulations with regard to other diseases should become clear with the coming into force of the International Sanitary Regulations in 1952 In the meantime on the suggestion of the International Union against Venereal Diseases the Netherlands Government established the Rotterdam Port Demonstration Centre with the assistance of WHO Among the activities of the Centre is the study of certain aspects of maritime venereal disease control and of the functioning of the Brussels Agreement

The control of venereal disease among seafarers and the place of venereal infections in maritime public health in general were also considered by the Joint ILO/WHO Committee on the Hygiene of Seafarers in 1949 [11] and will be studied again when this committee meets in April 1954 It is expected that the legal aspects of the Brussels Agreement will be considered by WHO in 1955 and that a study of the proposed WHO health regulations will subsequently be transmitted to governments and to the interested international organizations

WHO has published a revised edition of the *International list of venereal disease treatment centres at ports* which gives venereal disease clinics in the major ports throughout the world and the hours of attendance A further edition is due in 1955 Similarly the individual treatment record booklet issued under the Brussels Agreement has been revised and brought up to date

In its role as administrator of the Agreement WHO receives complaints from health administrations about services in ports and acts as intermediary between the governments concerned The exchange of epidemiological information is also encouraged

WHO was instrumental through its headquarters and its Regional Office for Europe in the establishment of the International Anti Venereal Disease Commission of the Rhine an intergovernmental body on which were represented the five countries sharing the Rhine River system

Finally WHO sometimes assists governments directly in the establishment of port treatment facilities for venereal infections e g in Karachi Pakistan

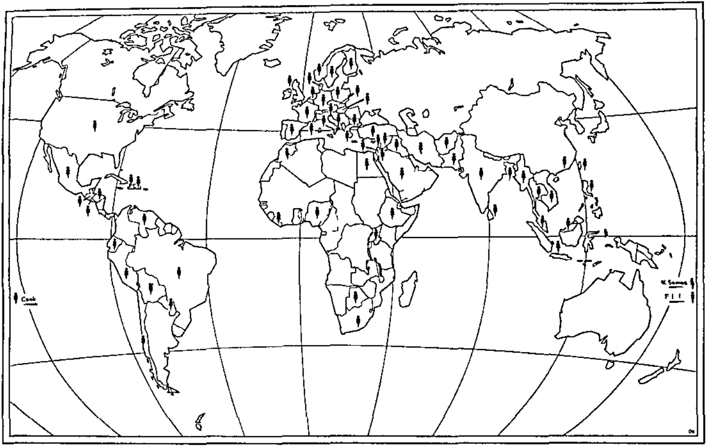
The technical interest of WHO in maritime venereal disease control has been in fostering standardized methods of diagnosis and therapy among seafarers so as to obtain more uniform treatment schedules and serological tests at ports in different countries Although wide variations still exist the introduction of penicillin therapy in syphilis has greatly simplified the previously complicated situation resulting from the need to retain seafarers for prolonged treatment ashore with metal chemotherapy The facts that penicillin treatment of early syphilis requires only a few sessions and that the patient need not be hospitalized have substantially reduced absenteeism and the number of man days lost in home and foreign ports which is an economic gain for the employer and employee alike and for the government concerned But new problems have arisen because of the comparative ease with which crews have access on board ship to penicillin given parenterally or orally for therapeutic and prophylactic purposes this has made post treatment control and follow up more complicated

The problem of immediate importance in maritime venereal disease control is early syphilis In some maritime countries the incidence of early syphilis has been less noticeable in port than in inland areas but on the other hand increasingly important ports in underdeveloped areas remain very real foci of infection at a time when the tonnage of post war merchant fleets has

---

[11] *Wld Hlth Org techn Rep Ser* 1950, 20

FIG 24 ACTIVITIES OF WHO TREPONEMATOSES CONSULTANTS AND ADVISERS 1948 53



nical reports of these groups have furnished the basis for WHO work against the treponematoses they are also a valuable source of up-to date technical information for physicians public health authorities and others interested in treponematoses control

Symposia and Other Conferences

WHO fosters exchange of technical information by sponsoring symposia and other international conferences Such meetings bring together leading specialists from different countries and make possible direct professional contact and exchange of views For example an international symposium on syphilis was organized in Helsinki in 1950 [1] and was attended by 28 participants from six countries in the same year a larger symposium at which participants numbered 76 and represented 12 countries was held in Paris [13] These symposia did much to reorient European medical opinion with regard to the new trends in the treatment of syphilis and to hasten the transition from metal chemotherapy to therapy based on penicillin

In 1952 an international symposium on yaws control was held in Bangkok and was attended by 39 participants from 23 countries This symposium covered every phase of yaws control and provided an important forum for the exchange of experiences in the large yaws control projects getting under way in several parts of the world The technical information which was presented at the symposium was subsequently published in a WHO monograph [14]

An earlier and different type of activity was that represented by the WHO Syphilis Study Commission to the USA in which a group of specialists from seven countries spent several months of 1949 in the USA to investigate and evaluate the use of penicillin in the syphilis-control programme of the USA as organized by the US Public Health Service The Commission also observed other aspects of the programme in the USA among them the technique of contact interviewing and the training of contact interviewers the morbidity and epidemiological report forms and the mechanical methods used in their filing and analysis and the inpatient facilities provided by rapid treatment centres and the education of the patients carried out therein

The Commission concluded that the venereal disease control methods used in the USA could well serve as a guide in planning future programmes elsewhere provided that they were suitably adapted to local conditions and requirements that the value of penicillin in the treatment of syphilis was an outstanding USA discovery and that the USA was at that time the place of choice for the study of venereal disease problems and control methods The results of the Commission s study were published in the WHO Technical Report Series [15]

Consultant Aid

Another more direct method of exchanging technical information is seen when the Organization provides an expert adviser or consultant for a national health administration Such technical personnel may be members of the staff of WHO headquarters or of the regional offices or may be experts recruited for assignment to a specific project for a shorter or longer period The provision of expert advice in this way has been found a most useful type of WHO assistance both in demonstration and training projects and

---

T an act on f the I t rnational Symp um on the Study f Syphilis (1951) H ls kl (*A derm ne ol (S ockh) Suppl me t m 4*)

Organisation M ndiale de l Sa té (1951) *C lloque I t rnational sur la Syph is P ris*

World Heal h Org ni tion (1953) *Fir t I ternational Sympo i m on Yaws Cont ol Geneva* (*W orld H alth Organization M nograph S ries* No 15)

Wld H th Org t hn R p Se 1950 15

strengthening the health services of nations and for bringing participants to symposia and international conferences in which WHO has had an interest

A number of special training courses have been organized with the assistance of WHO In Simla Himachal Pradesh India teams—composed of a venereologist a laboratory technician and a public health nurse—from different parts of the country were trained as groups in venereal disease-control methods A field seminar organized in connexion with the international yaws symposium in Bangkok was another type of group training A third example is the group-training courses in maritime venereal disease control at the port demonstration project in Rotterdam

WHO has also awarded a limited number of grants to universities and laboratories in support of work which has a direct bearing on the activities of health administrations and on WHO programmes For example grants have been made to the WHO Serological Reference Laboratory at the Statens Seruminstitut Copenhagen and to the International Treponematosis Laboratory Center at Johns Hopkins University Baltimore Md USA The activities of these centres are reviewed in a later section (pages 63 and 66) It should be mentioned here however that these laboratories also serve to train laboratory workers and technicians sent to them either by WHO or by other interested national and international organizations

Technical Documentation

One of the principal means of disseminating information is represented by WHO publications and technical documents through which the Organization makes available the information resulting from its own work

Treponematologists and public health workers will find information of interest to them particularly in three of the Organization s publications—the Technical Report Series the Monograph Series and the *Bulletin of the World Health Organization* The reports of the WHO Expert Committee on Venereal Infections and Treponematoses and of its Subcommittee on Serology and Laboratory Aspects and the collective views of other groups of experts such as the WHO Syphilis Study Commission to the USA will be found in the Technical Report Series Extensive studies which are considered to have lasting value and which are of wide general interest but which do not present a collective view of a problem are included in the Monograph Series This series contains either epidemiological or clinical studies on one specific subject by one individual author—such as the monograph *The epidemiology and control of endemic syphilis report on a mass treatment campaign in Bosnia*—or a collection of papers by a number of contributors on a certain topic—such as the selection of papers submitted at the First International Symposium on Yaws Control Finally the *Bulletin* contains in each volume a number of scientific papers prepared either by epidemiologists clinicians or public health workers who carry out assignments directly under the auspices of the Organization or by outside contributors who wish to give their original findings a wide international distribution

Information included by WHO in any of these publications has always to meet certain special requirements First and most specific of these is that it should have " international significance It is one of the principles of the WHO publications programme that a paper should not be included in an Organization publication if a more suitable vehicle for it exists Although the expression international significance is not easily defined it is meant in general to distinguish information which in contradistinction to that of a purely local or national interest is likely to be of practical value to health workers in a number of countries or to

in mass campaigns The countries which requested and received the services of WHO consultants and advisers during the period 1948 53 are shown in fig 24

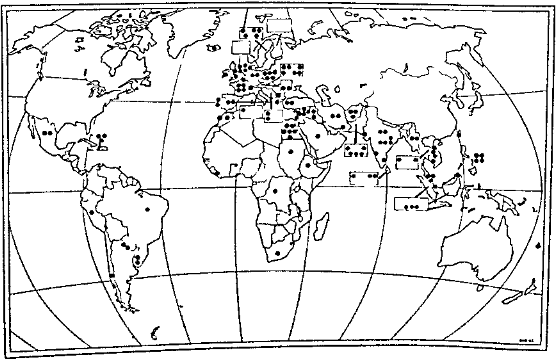
Fellowships and Other Professional Training Activities

The awarding of fellowships and travel grants has become an important and valuable form of Organizational aid to health administrations and to individuals In the years 1947 53 196 fellowships and travel grants concerned with the control of venereal diseases and treponematoses were awarded (fig 25) at a cost of approximately a quarter of a million dollars The distribution according to WHO Regions was as follows Africa 5 the Americas 21 South East Asia 47 Europe 78 Eastern Mediterranean 30 and Western Pacific 15

In some instances the training has been in general public health methods in others Fellows have studied syphilis control in clinics or at the city provincial, or national level in others again laboratory aspects or mass campaign practices have been the subjects of study Many of the fellowships have been granted in co operation with UNICEF as part of national treponematoses projects

The awarding of fellowships supplements the activities of demonstration and training centres and fellowship funds are usually included in such projects in order to provide the best available training for the medical officers and technical personnel who will bear the responsibility for developing the projects after the withdrawal of WHO assistance Fellowships and travel grants have also been given for studies abroad which will serve WHO s ultimate purpose of

FIG 25 DISTRIBUTION OF 196 TREPONEMATOSIS FELLOWSHIPS BY COUNTRIES OF ORIGIN FROM 1947 TO 1953



and Treponematoses from 18 countries are participating is to evaluate the possible advantages and disadvantages of the use of the new types of penicillin in individual patients both in clinic practice and in mass campaigns These studies are in many ways parallel to the operational research undertaken when PAM was first introduced in the treatment of the treponematoses and when subsequent simplification of injection techniques and dosage schedules were evaluated Such research as an integral part of WHO projects is profitable for the modifications which may result in health techniques and campaign procedures can mean greater efficacy at less cost in selective public health programmes

Another study assisted by WHO is the appraisal of extensive material made available by the Clinical Co-operative Group in Great Britain A number of venereal disease clinics there have pooled follow up data on different methods of syphilis treatment in the comparative evaluation of which WHO is assisting

Similarly WHO undertook in 1952 to compile information on current practices in leading venereal-disease clinics and among venereologists throughout the world in the treatment of early syphilis This study which ended late in 1953 and the results of which will be published in 1954 indicated a very clear general trend towards reliance on penicillin alone more than 80/ of the 277 venereologists participating in the investigation have adopted penicillin treatment without adjuvant therapy

THE INTERNATIONAL TREPONEMATOSIS LABORATORY CENTER

The International Treponematosis Laboratory Center was established with WHO assistance at Johns Hopkins University Baltimore in October 1950 The Center undertakes investigations of certain fundamental problems which can be handled only in a special research laboratory Also as previously noted it serves to train specialists and technicians from various countries under the WHO fellowship programme and under programmes of other institutions interested in laboratory research Much interesting and important work is being done the significance of which increases as the years go by

The first step was to isolate active strains of treponemes from various WHO treponematosis programmes in different parts of the world so that they could be used for comparative studies [15] Infected material has been prepared by members of WHO field teams inoculated into rabbits or hamsters and forwarded by air to the Center So far 12 of the 16 strains obtained from patients with venereal or endemic syphilis in Chicago Mexico Iraq and Bosnia from cases of bejel in Syria and Iraq and from yaws patients in Thailand Haiti Indonesia and Samoa have been successfully perpetuated in rabbits or hamsters No pinta strain has thus far been successfully established in experimental animals

It has been observed that there are persistent differences between and within established types and strains of treponemes It appears that these differences are quantitative rather than qualitative and it is believed that the characteristics of a particular strain are based primarily on its capacity to produce hyaluronic acid The possible influence of environmental factors including temperature on the characteristics of types and strains of treponemes is also being studied at the Center It has long been known that hot summer weather modifies the course of syphilis in experimental animals the influence of temperature on the development of skin lesions

T rner T B H lland D H & Sch ff K. (1953) *Bull Wld Hlth Org* 8 7

represent the achievements of international co operation in the field of health Studies of results in specific disease control methods which may be readily applied with modifications to all countries surveys of the geographical distribution of diseases and review articles prepared by outstanding experts on the basis of literature from all countries which have contributed to existing knowledge—these are among the types of articles which may be considered to be internationally significant In addition reports of surveys on specific subjects made by expert consultants on behalf of WHO after conferring with relevant workers in various countries and personal investigations covering wide areas as well as reports or original findings made in the course of WHO field programmes are considered to have international significance because they are essentially the outcome of international co operation In following this editorial policy the Organization endeavours to make a distinctive contribution to medical documentation by providing the research worker the epidemiologist the clinician and the health administrator with technical information to which he might not otherwise have access

Experience has shown that another noteworthy source of technical information is to be found in papers issued by the Organization in limited number as mimeographed documents Such documents are intended primarily for members of expert advisory panels or committees and for internal use by the staff or by laboratory and research institutes with which the Organization has close working relationships These documents can be made available to interested persons but they are not destined for library files or meant to be indexed in reference lists or reviewed by medical journals Papers which are considered of more lasting and general value are often included in one of the WHO technical publications as has already been noted

A list of WHO reports monographs articles and other publications on the treponematoses may be found on page 74

INTERNATIONAL CO-ORDINATION OF RESEARCH

The co ordination and promotion of research on health problems are among the functions of WHO particularly when such research is directly related to Organization programmes or projects Such international research can be accomplished by special field studies or by supporting existing institutions The present article attempts to give some idea of WHO s research activities relative to the treponematoses and their control

Operational research and special investigations are carried out to appraise the use and usefulness of various *treponematosis*-control practices in individual projects For example work is under way to evaluate the epidemiological and other data accumulated in the campaign against endemic syphilis in Bosnia This study is based on a mechanical punch card system established at the Central Syphilis Register in Sarajevo where copies of all field records of the entire campaign are available

As was mentioned earlier comparative studies of PAM and the new repository benzylamine penicillin salts in syphilis yaws and pinta are being co-ordinated by WHO in co-operation with leading national experts in several countries The purpose of these investigations in which members of the WHO Expert Advisory Panel on Venereal Infections

of the venereologist the treponematologist and the medical officer concerned with the control of venereal diseases and of the non venereal treponematoses

One of the basic changes in outlook in laboratory work in recent years has been the definition by WHO of the specificity of serological tests in terms of the treponemal diseases as a group rather than in terms of syphilis as was the case before 1952 However any conventional antigen for syphilis and the other treponemal diseases can under certain conditions give a false positive result If different serological techniques are applied a quantitative reagin titre in one country will not necessarily be comparable with that in another or for that matter with that in another laboratory in the same country

This is due not only to variations of method Results cannot be standardized by competitive serological conferences between authors of serological tests since variations in testing procedures the world over are considerable and particularly since the composition of antigens used and their reactivity also differ widely In the past serologists endeavoured to measure one unknown—the titre or the amount of reagin—by two others—either a variety of reagents (of which the constituents were largely unknown) or a variety of methods (for which there were no standards whereby their performance could be judged) The aim of WHO has therefore been to work towards the standardization of the two basic unknowns which might be controlled—the reagents and the methods—so that the unknown titre or reagin can be more accurately and uniformly measured In 1949 a WHO Serological Reference Laboratory was set up at the Statens Seruminstitut in Copenhagen to conduct a series of studies which might lead to the desired degree of standardization of reagents and methods (A review of the Laboratory s work will be found on the next page)

Standardization of antigens

Standardization of antigens has become feasible with the development in recent years of defined substances namely cardiolipin and lecithin which replaced the more uncertain lipoidal antigens obtained in the past from animal tissues The more specific cardiolipin antigens have now been accepted everywhere as the antigens of choice in the serodiagnosis of the treponematoses

After several years of laboratory studies by members of the WHO Expert Advisory Panel on the Serological and Laboratory Aspects of Venereal Infections and Treponematoses WHO in 1951 established international reference preparations of cardiolipin and lecithin by action of the Expert Committee on Biological Standardization [18] This has enabled laboratories and manufacturers all over the world to standardize their antigens against a known measure by obtaining samples from the Statens Serum institut Copenhagen These international reference preparations must however be replaced from time to time and continuous study is therefore required

A monograph by Mary C Pangborn the discoverer of cardiolipin antigen and her associates at the Division of Laboratories and Research of the New York State Department of Health was published by WHO in 1951 [19] This monograph contains much useful information on the preparation and the chemical and serological testing of these antigens A revised edition is due in 1954

Standardization of methods

The establishment of an international reference bank of strongly positive moderately positive and weakly positive reacting freeze dried sera (measured by titre) against

---

[18] *Wld Hlth Org techn Rep Ser* (195) 56

[19] Pangborn, M C Maltaner F Tompkins V N Beecher T Thompson, W R. & Flynn, M R. (1951) *Cardiolipin antigens* Geneva (*World Health Organization Monograph Series* No 6)

is of special interest warmth having an inhibitory effect during the incubation period of syphilis Such studies are particularly interesting in view of the unitarian theory that the differences among the treponemes causing syphilis yaws bejel etc may result from one single ancestral type of treponeme s having adapted itself to different environmental conditions

Problems of the immunological relationship of different strains of treponemes are also being studied as are the degree of immunity built up in infected rabbits judged by their reaction to challenge with another strain the relationship between specific antibodies and the development of antibodies during the course of infection A substantial degree of cross immunity among the various strains of treponemes has been demonstrated although the results with bejel and yaws strains are less clear than with different strains of syphilis It has also been shown by cross immunity studies using the *Treponema pallidum* immobilization (TPI) test that a close antigenic relationship among the treponemes is probable

A new treponemal agglutination (TPA) test has been developed by the Center the Naval Medical Research Institute in Bethesda Md and the Venereal Disease Experimental Laboratory at Chapel Hill N C The agglutination of killed *T pallidum* by the sera of syphilitic individuals had previously been attempted with varying success by a number of investigators but had not proved valuable as a diagnostic procedure owing to difficulties in maintaining a suitable suspension of viable organisms A procedure has now been found which eliminates these difficulties and preliminary studies with rabbit sera have shown a high degree of correlation between positive agglutination and the presence of syphilitic infection Results with human sera have also been encouraging when suitable techniques have been used A number of laboratory studies on this problem are now being co ordinated through WHO

Another discovery at the Center has been the adherence disappearance phenomenon which has been described in a recent publication [17] Specific techniques developed in connexion with this phenomenon have shown the presence of another specific antibody in the serum of infected individuals which is different from the reagins detected by the usual flocculation or complement fixation techniques

The Center has carried out many important comparative studies on the penicillin sensitivity of treponeme strains received from various WHO field projects in order to watch for the possible appearance of penicillin resistance a question clearly of great significance both to the medical world in general and to the mass campaigns under way against the treponematoses The Center has also been conducting investigations on the potential efficacy of antibiotics other than penicillin against treponemes these experiments have shown that though all the drugs tested have some activity against *T pallidum* penicillin is still the most effective known agent against treponemes

INTERNATIONAL STANDARDIZATION OF SEROLOGICAL REAGENTS AND METHODS

The effectiveness of treponematosis control programmes depends to a certain extent upon the efficient conduct of serological tests whether it be a question of the evaluation of the results in the treatment of syphilitic seafarers or of the comparative appraisal of results of mass treatment campaigns against yaws as carried out in pilot and control areas of such campaigns The laboratory remains essential to the work

[17] Nelson, R. A., Jr (1952) *Pr se med J* 60 1719

cases been dealt with and if so only for orientation purposes) and (c) antigen prepared at the Laboratory from the provisional international reference preparations of cardiolipin and lecithins of 1951 and 1953

The research work on serodiagnostic methods is concerned with lipid antigens on the one hand and the TPI test on the other

Shortly after the publication of the WHO monograph on cardiolipin antigens (see page 65) the serological techniques described therein were tried out with a view to perfecting their performance The purpose was to enable tests for the acceptance or rejection of new lots of cardiolipin and lecithin to be performed by similar methods at the Division of Laboratories and Research of the New York State Department of Health Albany N Y and at the Statens Seruminstitut Copenhagen

Preliminary studies on the keeping qualities of lecithins and cardiolipin antigens have been performed with the Copenhagen complement fixation technique Using this test method new lots of cardiolipin and lecithins have been compared with the provisional international reference preparations of cardiolipin and lecithins for 1951

Cardiolipin antigens have been compared with crude lipid antigens using different types of seroreactions such as complement fixation tube flocculation and slide flocculation the maturation phenomenon of cardiolipin antigens has been studied in complement fixation experiments and by nephelometric methods and the results of the various studies have been evaluated in close collaboration with the Statistical Department of the Statens Seruminstitut

In September 1952 the Laboratory was invited by WHO to take part in a co operative study on the TPI test The first WHO TPI control serum was prepared in Copenhagen it was distributed to 25 laboratories in March 1953 Preliminary quantitative results from ten laboratories (Copenhagen Washington Lyon Palermo Bordeaux Paris (2) Landstuhl Lille and Chamblee) were compiled at the Laboratory in July 1953 and it was found that the variation in titre was great suggesting the need for further investigation

Rabbits inoculated with *T pallidum* (Nichols pathogenic strain) have been sent to six different laboratories in Europe The attainment of optimal survival conditions for pathogenic *T pallidum* in vitro has been and still is subject to intense study

In November 1950 14 specimens of blood mainly from syphilitics were collected and freeze dried serum was prepared for use in a preliminary experiment in which the suitability of freeze dried serum for serological evaluation as well as the keeping quality at different temperatures was tested in the Copenhagen Laboratory and in laboratories in the following cities Bergen Calcutta Chamblee London and Tel Aviv This pilot experiment resulted in the recommendation that further studies on the value of freeze dried sera in the evaluation of serological methods be undertaken It was decided that 80 sera from selected donors (syphilitic and non syphilitic) should be freeze dried The Laboratory has thus far prepared 19 freeze dried sera and has collected an additional 28 sera from other laboratories Early in 1953 samples of the first 30 sera (some in duplicate) were sent out to a number of laboratories of members of the Expert Advisory Panel on Serology and Laboratory Aspects

In March 1951 the WHO Reference Laboratory was requested to take part in the chemical analysis of samples of cardiolipin and lecithin for the Expert Committee on the Unification of Pharmacopoeias Specifically the Laboratory undertook the phosphorus analysis and the determination of dry weight In 1953 the chemical results from other laboratories were studied

which existing serological methods in use anywhere in the world can be compared is the logical second step in the standardization work of the WHO Reference Laboratory at Copenhagen

The work on freeze drying has been carried out by a number of laboratories (Bombay Caracas Coonoor Johannesburg London Madras Naples and Osaka) in co operation with the Copenhagen Laboratory which has in turn sent sera for testing to 15 labora tories in different parts of the world (Albany Bergen Bombay Cairo Calcutta Caracas Chamblee Coonoor Johannesburg London Naples New York Osaka Tel Aviv and Trondheim) so as to ensure as wide a basis as possible for the planned reference bank

At the seventh session of the WHO Expert Committee on Biological Standardization held in 1953 it was decided that the stability of freeze dried sera had been proved in the preparatory studies carried out by the co operating laboratories and that actual international reference preparations could now be established Action is being taken accordingly and it will therefore be possible in the course of 1954 for national labora tories all over the world to obtain samples of international reference sera from Copen hagen—enabling them to guide serological workers in their countries in carrying out tests with a defined degree of seroreactivity determined by the titres of the freeze dried sera—in addition to obtaining defined cardio lipin antigen reference preparations

Standardization of methods has also been fostered by the inter laboratory exchange of sera for other purposes for instance for determining the stability of sera in postal transmission Twenty six laboratories (Montreal Ottawa Albany New York Copenhagen Chamblee Havana Mexico Montevideo Reykjavik Lisbon London Brussels Bergen Zurich Palermo Vienna Helsinki Ankara Tel Aviv Cairo Baghdad Teheran, Calcutta Colombo and Jogjakarta) and a number of WHO field teams (e g in Guatemala Simla and Bangkok) have participated in various studies of this kind

Parallel work has been undertaken by the Venereal Disease Research Laboratory and Training Center in Guatemala which has aimed at the standardization of serological tests in Central America under the auspices of the Pan American Sanitary Bureau and WHO Assistance in serological work has also been given in that part of the world by a number of training courses which have been attended by many technicians from most of the Central American countries The influence of these courses has already shown itself in the syphilis-control pro grammes in the Americas

As already mentioned much of the work in standardization of serological reagents and methods has been carried out by the WHO Serological Reference Laboratory in Copenhagen in co operation with a number of national laboratories To illus trate the type of work undertaken at the Laboratory a review of some of its activities is given below

THE WHO SEROLOGICAL REFERENCE LABORATORY

The work of the WHO Serological Reference Laboratory Copenhagen falls under four principal headings (1) evaluation of antigens for the serodiagnosis of syphilis (2) testing samples of blood or serum trans mitted to the Laboratory (3) research work on serodiagnostic methods and (4) training of personnel in the use of serodiagnostic methods In return for this work WHO makes a yearly grant to the Laboratory

Three different categories of antigen have been tested (*a*) antigen used or to be used by WHO field teams (work with this type of antigen has predominated) (*b*) antigen from producers (only in a few instances have such

CONSOLIDATION OF RESULTS

The more specific objectives of international co-operation in treponematosis control have already been outlined (page 33) and the contributions which selective public health projects against these infections can make towards "the highest attainable standard of health"[1] have been suggested However any group of public health workers which attains a high degree of specialization may sometimes tend to overlook the fact that in the final analysis its work will be productive *only* if supported by a general programme of disease prevention Work in conjunction with other health activities (maternal and child health malaria tuberculosis etc) is desirable whenever initial exploration of the health problems in an area shows technical and administrative advantages As has already been mentioned selective public health projects are potential bridgeheads for extension into broader multiphasic public health activities both in urban and rural areas and provide a method of strengthening the structure of local as well as national health services—a basic aim of WHO[2]

In the past the advantages and disadvantages of the approach to disease control and to the improvement of health in general by the stationary urban clinic and rural health centre system have been realized But little information on mass campaigns has been available until recent years when extensive malaria tuberculosis and treponematosis control activities have been undertaken by health administrations with international assistance

That the non venereal treponematoses can be controlled by mass application of penicillin is indicated by the results observed in resurveys conducted in a number of sample and control areas This is illustrated for yaws in table VII for endemic syphilis the evidence already given in table VI (page 43) and fig 18 (pages 44 5) speaks for itself In other instances the results have been less good and the number of new cases represented by reinfections infectious relapses or cases reintroduced from neighbouring areas has caused some concern This question is to some extent connected with the intensity of the treatment of household and community contacts in the different projects

TABLE VII RESULTS OF SAMPLE RESURVEYS AFTER 6-12 MONTHS IN CONTROL AREAS OF FOUR YAWS CONTROL PROJECTS

Project area		Number examined	Cases of yaws	
			number	%
Haiti	1st survey	9 7	4 160	42 6
	2nd survey	12 915	103	0 8
Indonesia	1st survey	1 632	357	21 9
	2nd survey	1 667	96	5 7
Philippines	1st survey	16 072	2,900	18 0
	2nd survey	16 481	400	.5
Thailand	1st survey	313 338	56 407	18 0
	2nd survey	3.3 800	2,241	0 6

It is evident that the good initial results obtained by a mass "sweep" of the population with penicillin must be followed by resurveys The mass treatment phase of campaigns against any of the treponematoses is but the first step towards full control and eradication of the infection Control efforts must be continued even after that phase follow up examinations and where necessary re treatment must be carried out if the benefits of the original action are not to be lost[3] Governments must provide for this continuity in their planning and in drawing up their budgets Past and ultimately unsuccess

[1] From preamble to the Constitution of the World Health Organization, In World Health Organization (1953) *Handbook of basic documents*, Geneva, 6th edition, p 3

[2] Bonne W M Guthe, T & Reynolds F W (1953) *Bull Wld Hlth Org* 8 371

[3] Guthe T Reynolds F W Krag P and Willcox R R (1953) *Brit med J* 1 594

TREPONEMATOSIS CONTROL
AS A MEANS TO AN END

Health activities as a means of international co operation are not new but can be traced as far back as the 14th century However there has been a significant change in emphasis and objectives since those early times From the dissemination of information and the setting up of quarantine regulations to prevent the spread of pestilential diseases from one country to another international health activities have been extended to the pooling of knowledge experience and resources to provide direct assistance to countries in communicable disease control and in the general promotion of the health of their people A principal objective has now become the control and eventual elimination of diseases of public health importance wherever they occur

Like most other projects of assistance to governments treponematosis control whether it be through an urban programme for the control of venereal syphilis based on stationary clinics or through a mass campaign against a non venereal treponematosis in a rural area can also serve as a bridgehead for the development of local health services At some point in the treponematosis control programme, the gains should be consolidated as part of general communicable-disease control The activities required to keep the infection at a controllable level—or to eliminate it completely—should be integrated into the local or national health services This integration represents a new challenge in modern public health work As the need for intensive treponematosis-control measures diminishes general public health activities of gradually increasing scope may then take precedence over the fight against this specific infection Through long term planning treponematosis control may thus become a means to an end—namely the strengthening of local health services

ECONOMIC ASPECTS OF TREPONEMATOSES CONTROL

The economic value of the health of its inhabitants to a community is a subject which is receiving the increasing attention of governments Studies on this subject are still insufficient particularly as regards the less-developed areas but attempts to translate health into terms of economic productivity and gain have shown how serious are the losses attributed to ill health and how profitable can be action against them Such attempts can be only approximations yet they have provided a basis for interesting and stimulating discussion

Several illustrations of this thesis are provided by the treponematoses It has been estimated that 100 000 man days of labour are lost annually as a result of venereal diseases in Southern Rhodesia [4] and in Haiti where yaws was widely prevalent among the rural population the 35 000 to 55 000 persons treated monthly in the joint WHO/UNICEF programme have meant the return to work of approximately 100 000 incapacitated persons and a consequent increase in national production of $5 000 000 a year [5]

In some countries it has been possible to estimate directly the loss of manpower attributable to venereal syphilis in military forces civilian life and industry and to calculate the cost of institutional care of late syphilitics Thus the disability and cost to the nation from syphilis in the USA is illustrated on page 73 [6] Efforts have also been made to calculate indirectly the value of certain preventive measures such as obligatory premarital serological examinations in the State of California for example it was estimated that for the years 1949 1950 and 1951 a total loss of $6 339 274 in productive manpower and domiciliary care was prevented by this screening method and that this meant a yearly saving to the State of $1 275 364 [7]

The economic loss caused by the treponematoses is reflected in the age groups from which they take their toll in the form of incapacitation invalidism or the need for special medical care It is obvious that infancy and early childhood are a period of investment for the family and community It is considered for example that in the USA the non productive phase of life extends to the age of 18 years and that this period entails an investment in the child up to that age of more than $7 000 for a family with an annual income of $2 500 [8] In other countries particularly in agricultural areas and where child labour in industry is common the child begins to be productive at a much earlier age even so it is almost certain that up to the age of 15 years the investment in a child greatly exceeds the economic return

What does this mean in populations in which yaws or other treponematoses are prevalent ? It has already been pointed out (page 15) that the age distribution of the non venereal treponematoses is different from that of venereally acquired syphilis since the former are primarily diseases of childhood while the latter affects those who have reached sexual maturity This is illustrated

---

Winslow C. E. A (1951) *Th* ... *and the p* ... *h* ... G ... (W ld H lth *Org* ... M ... *g* ... *ph* ... ies N 7) p 30

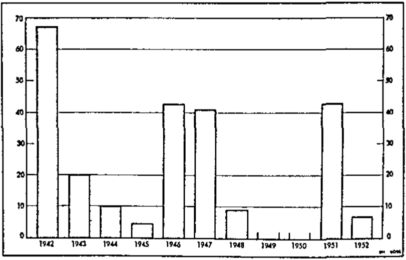
US D p rtment of St t (1950) *Pol* ... *per* ... d ... *lopm* ... *lly* ... *nde de l p d* ... W h gton, D C (Publ tion 3719 Eco mi Coope t o Se es 24)

F d l Security Agency Publ H lth Service (195) VD F ct Sheet, D visio f V ne l D ease Office f Stat t cs ... mbe 9

Co dit, P K & B w A F (1953) *Ame J p bl Hl h*, 43 880

D blin, L I L tka, A J & Sp g lm M (1947) *Th* ... New Y k, p 50

FIG 26 INCIDENCE OF YAWS IN HARKERS HALL AREA ST CATHERINE, JAMAICA



Ordinates attack rate per 1 000 inhabitants

Mass treatment was carried out during the years 1942-45 1947 and 1951 52 but the results were not consolidated and the efforts were thus largely wasted

N dat re a llabl f the y ar 1949 50

ful eradication campaigns have made this abundantly clear the rise and fall in the incidence of yaws shown in fig 26 are due largely to insufficient follow up measures When the reservoir of infection has been sufficiently reduced the consolidation of the results may be continued under general public health programmes This will of course depend on the existence or creation of permanent rural health facilities in the areas concerned It should be possible for health administrations to take advantage of the progress made and to reinforce the rural health administrations with staff previously engaged in the mass campaigns Further planning by health administrations WHO and UNICEF is needed if vast efforts and funds are not to be wasted and if recurrence of the treponematoses in endemic or hyperendemic form is to be avoided

Whether the victory will be final also depends on the degree of social advancement in the areas treated The epidemiological environment is changed by mass treatment but there must also be a corresponding change in the social environment—and that as soon as possible—if it is not to contribute to a recurrence of the spread of the treponematoses What has taken many countries centuries to achieve in the past can now take place in a few decades There is good reason to hope that the mass campaigns themselves contribute substantially to the health education of the public through the convincing complete disappearance of lesions and the rapid cure

Parallel health projects in fields other than the treponematoses also help substantially towards this change in the social environment which it should be said has already begun in many areas WHO is concerned with all aspects of public health and social medicine and especially with the training of personnel in preventive medicine and hygiene Considerable success is being achieved in the control of malaria and other insect borne diseases such as yellow fever Immunization against tuberculosis with BCG is widespread in some areas immunization projects against diphtheria and pertussis have been encouraged Epidemics of poliomyelitis and influenza call for prompt action and research Health education and activities in maternal and child health nutrition and social and occupational health are being promoted and problems such as drug addiction and chronic diseases are not excluded from consideration Achievements in such a variety of fields cannot fail to leave an impression in underdeveloped areas

even more willing to work and work well This by itself tends to raise productivity It is also true that, according to the principle of cumulative causation an improved health standard will per se always tend to improve all other component factors in the plane of living.

In effect, medical advances can serve as "pacemakers" of social change a view which was pointed out to the United Nations Social Commission "In the underdeveloped areas release of the resources of the countries from the tangled undergrowth of mass disease is a prerequisite for development" [14]

The WHO Expert Committee on Venereal Infections and Treponematoses [15] has pointed out "Penicillin in mass diseases like syphilis and yaws is indeed an important pacemaker of this kind "

[14] United Nations (1952) *Pr liminary eport on the world social tua ion with special f enc t standards of li ing* New Y rk, hapter III, p 32 (document E,CN.5/267/Re 1)

[15] *Wld Hlth Org techn R p Ser* 1953 63 7

Millions of people are incapacitated by the treponematoses during the most productive period of their lives in areas where national development requires able bodies to assist in agricultural industrial and other programmes for economic expansion In such areas the widest possible application of penicillin in treponematosis-control programmes is a means to an end and represents an element in social and economic progress Much remains to be done nationally and internationally but the impact of the work under way has already begun to be discernible in many parts of the world

DISABILITY FROM AND COST OF SYPHILIS IN THE USA *

Estimated disability from syphilis in man-years

Hospitalization for insanity from syphilis (1950)	42,438
Disability from cardiovascular syphilis including aneurysm (1949)	12,332
Disability from locomotor ataxia (1949)	2,080
Disability from syphilitic blindness (1949)	39 000

Estimated annual cost of syphilitic psychosis and syphilitic blindness in US $

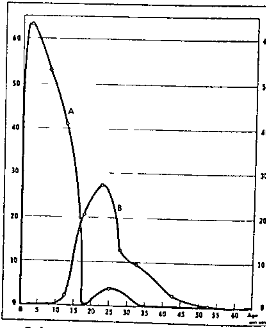
Maintenance of patients with syphilitic psychoses (1950)	41 162 000
Loss of income by patients with syphilitic psychoses (1950)	86 489 000
Loss of State and Federal income tax payments from patients with syphilitic psychoses (1950)	6 790 000
Maintenance of syph litic blind (1949)	18 750 000

* Federal Security Agency Public Health Service (1952) VD Fact Sheet Di is f Vener al Disease Office of Statis ics, Is ue numbe 9

in fig 27 based for yaws on material from an area in Jamaica [9] and for venereal syphilis on data for an urban area in the USA (Baltimore) [10] It will be seen that more than 42 5 persons per 1 000 had acquired yaws before the age of 15 and that the attack rate after that age was only 1 5 per 1 000 In venereal syphilis on the other hand the rate was only 2 12 per 1 000 among those under 15 years of age and much higher thereafter From a social and economic standpoint however the result in terms of productive manpower is the same in yaws the early onset of the disease results in a variety of disfiguring and invaliding mani festations including locked ankles and elbows and plantar and palmar lesions during the most productive years of life in venereal syphilis the productive age groups are attacked directly with consequent im mediate absenteeism and incapacitation for work and with neurological cardiovascular and other systemic involvement which later causes a further important loss of manpower if the disease is untreated

Another economic factor is the neonatal mortality attributable to the treponematoses The higher death rate among congenitally syphilitic infants compared with that of children born of healthy mothers has long been recognized Moreover venereal syphilis is known to be the cause of approximately half the stillbirths and abortions in untreated syphilitic women That this is true to some extent also among pregnant women suffering from endemic syphilis has been contended by Grin [11] There is some evidence that yaws too may result in increased infant mortality [12] although it is generally believed that this disease does not play an important role as a natural population check Yaws is more of a crippler than a killer and yaws control programmes mean that there will be increased manpower for productive purposes rather than more mouths to feed

FIG 27 ONSET OF YAWS (JAMAICA) AND DISCOVERY RATES FOR EARLY SYPHILIS (BALTIMORE) BY AGE GROUPS



Ordinates annual rates per 1 000 population
A — Yaws in Jamaica
B — Syphilis in Baltimore

Apart from these profit and loss considera tions there are wider logical grounds on which health programmes should form part of general programmes for social and economic development wherever possible Myrdal [13] for example has said

" It is true that an improved health standard will imply both a more favourable age structure of the population with a larger part of it in the productive ages and in every age group a people more able and

H ll, K. R (1953) *Non-sp cific factors in the pidemiology f yaw* I W ld H alth Organizat o *Fir I t rna ional Sympo ium on Y w C trol* Geneva (*World H al h Organiza ion Mono g aph Series* No 15) p 17

T rner T B Dyar R Clark E. G & Birkha d, M F (1943) *Amer J Hyg* 37 273

Grin, E. I. (1953) *Epidemiology and ontrol f endem syphili report on a mass-treatme t campaign in Bosnia*, Geneva (*World Health Organization Monograph Serie* No 11), p 41

Saunders, G M & Muench H (1937) *Amer J Hyg* 26 4.3

Myrdal C (195) *Chro Wld Hl h Org* 6 211

GRIN E. I
Endemic syphilis in Bosnia clinical and epidemiological observations on a successful mass treatment campaign *Bull Wld Hlth Org* 7 1
TURNER T B & HOLLANDER D H
Studies on treponemes from cases of endemic syphilis *Bull Wld Hlth Org* 7 75
KVITTINGEN J CUTLER J C McCULLOUGH J A ROSE, E. FORD V TAMPI R B SEN S & LAKSHWIR
Serological aspects of a syphilis-control programme in the Ghund Area, Himachal Pradesh, India *Bull Wld Hlth Org* 7 83

1953

TURNER T B HOLLANDER, D H & SCHAEFFER K
Biological investigations on treponemes *Bull Wld Hlth Org* 8 7
HILL, K. R
Non specific factors in the epidemiology of yaws *Bull Wld Hlth Org* 8 17
LEVITAN S RODRIGUEZ C. JACOBS J C. PETRUS E & DURAND J B
The treatment of infectious yaws with one injection of penicillin *Bull Wld Hlth Org* 8 55
KITCHEN D K & REIN C. R.
Time-dose relation in penicillin therapy with special reference to yaws laboratory basis for effective therapy *Bull Wld Hlth Org* 8 77
REIN C. R & KITCHEN D K.
Time-dose relation in penicillin therapy with special reference to yaws clinical basis for effective therapy *Bull Wld Hlth Org* 8 91
HILL, K. R
Antibiotics other than penicillin in the treatment of yaws *Bull Wld Hlth Org* 8 107
HACKETT C J
Extent and nature of the yaws problem in Africa *Bull Wld Hlth Org* 8 129
VAUCEL, M A.
Le pian dans les territoires africains français *Bull Wld Hlth Org* 8 183
JUNGALWALLA, N
Planning for yaws control in South East Asia *Bull Wld Hlth Org* 8 213
GUIMARÃES F N
Yaws in Brazil *Bull Wld Hlth Org* 8 225
REIN C. R
Diagnostic aids in mass treatment campaigns against yaws *Bull Wld Hlth Org* 8 245
PETRUS E LEVITAN S IAOLIELLO A & NICOL, R
La campagne antipianique en Haïti *Bull Wld Hlth Org* 8 261
SOETOPO M & WASITO R
Experience with yaws control in Indonesia preliminary results with a simplified approach. *Bull Wld Hlth Org* 8 273
HACKETT C. J
Consolidation phase of yaws control experiences in Africa *Bull Wld Hlth Org* 8 299
CRUZ A H
Integration of yaws control into the permanent health structure of the Philippines *Bull Wld Hlth Org* 8 345
TROUPIN J L REYNOLDS F W & GUTHE T
Yaws control—an opportunity for promoting rural health services *Bull Wld Hlth Org* 8 355
BOWNE W M GUTHE, T & REYNOLDS F W
The role of the World Health Organization in yaws control *Bull Wld Hlth Org* 8 371
KEENY S M
The role of the United Nations International Children s Emergency Fund in yaws control *Bull Wld Hlth Org* 8 379

PAPERS ON TREPONEMATOSIS CONTROL PUBLISHED BY WHO

Bulletin of the World Health Organization

1949

GUTHE T
Venereal diseases in Ethiopia *Bull Wld Hlth Org* 2 85
International control of venereal disease excerpts from the report on the second session of the Expert Committee on Venereal Diseases *Bull Wld Hlth Org* 2 139

MAHONEY J F & ZWALLY M R
Observations on the serodiagnosis of syphilis *Bull Wld Hlth Org* 2 227

THOMAS E W
Rapid treatment of syphilis with penicillin I A survey of the problem *Bull Wld Hlth Org* 2 233

THOMAS E W
Rapid treatment of syphilis with penicillin II Penicillin in prenatal and infantile syphilis *Bull Wld Hlth Org* 2 249

1950

BEKIERKUNST A & MILGROM F
Complement fixation reactions with cardiolipin antigen compared with Kahn reactions *Bull Wld Hlth Org* 2 687

CUTLER J C
Survey of venereal diseases in Afghanistan *Bull Wld Hlth Org* 2 689

1951

PANGBORN M C MALTANER F TOMPKINS V N BEECHER T THOMPSON W R & FLYNN M R
Cardiolipin antigens *Bull Wld Hlth Org* 4 151

HILL, K KODIJAT R & SARDADI M
Atlas of framboesia a nomenclature and clinical study of the skin lesions *Bull Wld Hlth Org* 4 201

1952

CUTLER J C., KVITTINGEN J ROSE, E McCULLOUGH J C TAMPI R B SEN S PARMAR, C & LAL, G
Mass treatment of syphilis in an Indian province report of the World Health Organization Venereal Disease Demonstration Team in the Ghund area of the Himachal Pradesh India *Bull Wld Hlth Org* 5 377

KVITTINGEN J., McCULLOUGH J C., TAMPI, R B & BHALLA J J
Significance of rapid serological testing for syphilis in field surveys *Bull Wld Hlth Org* 5 473

KVITTINGEN J CUTLER, J C. GUEVARA J A. McCULLOUGH J C ROSE E., FORD V TAMPI R. B SEN S LAKSHMIR KHAN J & DASS, P
Serological tests for syphilis in lepers tendency for various antigens to give false positive reactions *Bull Wld Hlth Org* 5 481

GHORPADE, K. V
Comparison of two commercial Meinicke antigens report on the use of three different qualities of saline in the preparation of each antigen for serological testing *Bull Wld Hlth Org* 5 513

Rein, C. R., Kitchen, D. K., Marquez, F. & Varela, G.
Penicilina de acción retardada en el tratamiento del mal del pinto en el campesino mexicano: estudio clínico y serológico. *Bol Ofic sanit pan-amer* 33 95

Bauer, T. J.
Tratamiento y control modernos de las enfermedades venéreas. *Bol Ofic sanit pan-amer* 33 105

Stout, G., Mendez, J. & Guzman, M.
Reacciones serológicas para sífilis presuntamente positivas falsas en la América Central. III. Relación con el contenido de proteína, albúmina y globulina en el suero. *Bol Ofic sanit pan-amer* 33 110

Gayoso, P. C.
Métodos modernos de control de las enfermedades venéreas. *Bol Ofic sanit pan-amer* 33 116

Funes, J. M. & Aguilar, C. Luz
La solución de mafarside-orvus en la profilaxis de la blenorragia en la mujer. *Bol Ofic sanit pan-amer* 33 121

Samame, G. E.
Naturaleza y extensión del problema del pian en las Américas. *Bol Ofic sanit pan-amer* 33 126

Goodman, H.
Metodo para vencer la renuencia de los enfermos venéreos a revelar sus contactos. *Bol Ofic sanit pan-amer* 33 142

Simpson, W. G. & Murphy, V.
Necesidad de mejorar la formación profesional de las enfermeras de venereología. *Bol. Ofic sanit pan-amer* 33 146

1953

Bonne, W. M., Guthe, T. & Reynolds, F. W.
El Papel de la Organización Mundial de la Salud en el control del pian. *Bol Ofic sanit pan-amer* 34 340

Edmundson, W. F.
Control antivenéreo por la aplicación profiláctica de penicilina a grupos muy expuestos. *Bol Ofic sanit pan-amer* 34 347

Guimarães, F. N.
El pian en Brasil. *Bol Ofic sanit pan-amer* 34 468

Roberts, P. W.
Informe clínico sobre el empleo de la penicilina en el tratamiento de 100 casos de mal de pinto. *Bol Ofic sanit pan-amer* 34 542

Salas, A. C.
Control de las enfermedades venéreas en la zona fronteriza Mexicana-[illegible]. *Bol Ofic sanit pan-amer* 35 124

Guevara, J. A. & Masi, D. A.
Control de las enfermedades venéreas en el Paraguay. *Bol Ofic sanit pan-amer* [illegible]

Hill, K. R.
Tratamiento del pian con antibióticos distintos de la penicilina. *Bol Ofic sanit pan-amer* [illegible]

Edmundson, W. F., Rico, A. L. & Olansky, S.
Estudio clinicoserológico del mal de pinto. *Bol Ofic sanit pan-amer* [illegible]

Monographs

Hill, K. R., Kodijat, R. & Sardadi, M.
Atlas of framboesia (World Health Organization: Monograph Series [illegible] *Bull World Hlth Org* 1951 4 201)

Pangborn, M. C., Maltaner, F., Tompkins, V. N. [illegible]
Cardiolipin antigens (World Health Organization: Monograph Series [illegible] *Bull World Hlth Org* 1951 4 151)

1949

WRIGHT R. D & NICHOLSON F P
Treatment as a factor in the control of the venereal diseases *Bol Ofic sanit pan-amer* 28 462
COUTTS W E
Organización de la lucha antivenerea bases principales en que actualmente debe apoyarse una campaña *Bol Ofic sanit pan-amer* 28 545

1950

ARNOLD R C. & MAHONEY J F
Función de los antigenos de cardiolipina en la serologia de la sífilis *Bol Ofic sanit pan-amer* 29 397
Tecnica de floculación en portaobjetos de VDRL prueba de floculación en tubo de VDRL prueba de VDRL para liquido cefalorraquídeo *Bol Ofic sanit pan-amer* 29 509
THOME J V
Modificaciones que deben hacerse a las actividades educativas antivenéreas de acuerdo con los progresos registrados en su terapéutica con el uso de los antibióticos *Bol Ofic sanit pan amer* 29 945
GOODEN D R
Influencia de un programa profiláctico penicilínico en la incidencia de las enfermedades venéreas *Bol Ofic sanit pan-amer* 39 1051

1951

SAMAME, G
Profilaxis sistémica antivenerea informe preliminar sobre el programa de Tijuana B C. *Bol Ofic sanit pan-amer* 30 42
CUTLER J C & STOUT G
Problemas serológicos en Centro América *Bol Ofic sanit pan-amer* 30 321
Control o erradicación de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 169 (Editorial)
REIN C. R
Problemas en el serodiagnóstico de la sífilis *Bol Ofic sanit pan-amer* 31 105
KITCHEN D K.
Penicilinoterapia moderna desenvolvimiento eficacia reacciones *Bol Ofic sanit pan-amer* 31 118
BREWER F A
Los nuevos antibióticos en el tratamiento de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 127
SANCHEZ PEREZ, R.
Epidemiologia de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 132
STOUT G W & REYNARD R
Primera encuesta serológica centroamericana *Bol Ofic sanit pan-amer* 31 141
SAMAME, G
Organización de una división de control de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 151

1952

SAMAME, G
Programas de control de las enfermedades venéreas de la Oficina Sanitaria Panamericana, Oficina Regional de la Organización Mundial de la Salud. *Bol Ofic sanit pan-amer* 32 37
STOUT G GUZMAN M & SCRIMSHAW N S
Reacciones serológicas para sífilis presuntamente positivas falsas en la América Central I Incidencia y distribución. *Bol Ofic sanit pan-amer* 32, 206
Reacciones serológicas para sífilis presuntamente positivas falsas en la América Central. II Relación con el ácido ascórbico riboflavina fosfatasa alcalina carotina y vitaminas A y E en el suero sanguineo *Bol Ofic sanit pan-amer* 32, 521

Rein, C. R., Kitchen D K. Marquez F & Varela, G
Penicilina de acción retardada en el tratamiento del mal del pinto en el campesino mexicano estudio clínico y serológico *Bol. Ofic sanit pan-amer* 33 95

Bauer, T J
Tratamiento y control modernos de las enfermedades venéreas *Bol Ofic sanit pan-amer* 33 105

Stout G Mendez, J & Guzman M
Reacciones serológicas para sífilis presuntamente positivas falsas en la América Central. III. Relación con el contenido de proteína albumina y globulina en el suero *Bol Ofic sanit pan-amer* 33 110

Gayoso P C.
Métodos modernos de control de las enfermedades venéreas *Bol Ofic sanit pan-amer* 33 116

Funes, J M & Aguilar, C. Luz
La solución de mafarside-orvus en la profilaxis de la blenorragia en la mujer *Bol Ofic sanit pan-amer* 33 121

Samame G E.
Naturaleza y extensión del problema del pian en las Américas *Bol Ofic sanit pan-amer* 33 126

Goodman H
Método para vencer la renuencia de los enfermos venéreos a revelar sus contactos *Bol Ofic sanit pan-amer* 33 142

Simpson W G & Murphy V
Necesidad de mejorar la formación profesional de las enfermeras de venereología *Bol Ofic sanit pan-amer* 33 146

1953

Bonne, W M Guthe, T & Reynolds F W
El Papel de la Organización Mundial de la Salud en el control del pian *Bol Ofic sanit pan-amer* 34 340

Edmundson W F
Control antivenéreo por la aplicación profiláctica de penicilina a grupos muy expuestos *Bol Ofic sanit pan-amer* 34 347

Guimarães F N
El pian en Brasil. *Bol Ofic sanit pan-amer* 34 468

Roberts P W
Informe clínico sobre el empleo de la penicilina en el tratamiento de 100 casos de mal de pinto *Bol Ofic sanit pan-amer* 34 542

Salas A. C
Control de las enfermedades venéreas en la zona fronteriza Mexicana Estadounidense *Bol Ofic sanit pan-amer* 35 124

Guevara, J A & Masi D A.
Control de las enfermedades venereas en el Paraguay *Bol Ofic sanit pan-amer* 35 132

Hill, K. R.
Tratamiento del pian con antibióticos distintos de la penicilina. *Bol Ofic san t pan-amer* 35 147

Edmundson W F Rico A L. & Olansky S
Estudio clinicoserológico del mal de pinto *Bol Ofic sanit pan-amer* 35 163

Monographs

Hill, K. R. Kodijat R & Sardadi M
Atlas of framboesia (World Health Organi at on Monograph Se ies No 5 also published in *Bull Wld Hlth Org* 1951 4 201)

Pangborn M C Maltaner F Tompkins V N Beecher, T Thompson W R & Flynn M R.
Cardiolipin antigens (World Health Organi ation Monog aph Series No 6 also published in *Bull Wld Hlth O g* 1951 4 151)

1949

WRIGHT R. D & NICHOLSON F P
Treatment as a factor in the control of the venereal diseases *Bol Ofic sanit pan-amer* 28 462

COUTTS W E
Organización de la lucha antivenerea bases principales en que actualmente debe apoyarse una campaña *Bol Ofic sanit pan-amer* 28 545

1950

ARNOLD R C & MAHONEY J F
Función de los antígenos de cardiolipina en la serología de la sífilis *Bol Ofic sanit pan-amer* 29 397

Técnica de floculación en portaobjetos de VDRL prueba de floculación en tubo de VDRL prueba de VDRL para líquido cefalorraquídeo *Bol Ofic sanit pan-amer* 29 509

THOME J V
Modificaciones que deben hacerse a las actividades educativas antivenéreas de acuerdo con los progresos registrados en su terapéutica con el uso de los antibióticos *Bol Ofic sanit pan-amer* 29 945

GOODEN D R
Influencia de un programa profiláctico penicilínico en la incidencia de las enfermedades venéreas *Bol Ofic sanit pan-amer* 39 1051

1951

SAMAME, G
Profilaxis sistémica antivenérea informe preliminar sobre el programa de Tijuana B C *Bol Ofic sanit pan-amer* 30 42

CUTLER J C & STOUT G
Problemas serológicos en Centro América *Bol Ofic sanit pan-amer* 30 321

Control o erradicación de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 169 (Editorial)

REIN C. R
Problemas en el serodiagnóstico de la sífilis *Bol Ofic sanit pan-amer* 31 105

KITCHEN D K
Penicilinoterapia moderna desenvolvimiento eficacia reacciones *Bol Ofic sanit pan-amer* 31 118

BREWER F A
Los nuevos antibióticos en el tratamiento de las enfermedades venéreas *Bol Ofic sanit pan amer* 31 127

SANCHEZ PEREZ R
Epidemiología de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 132

STOUT G W & REYNARD R
Primera encuesta serológica centroamericana *Bol Ofic sanit pan-amer* 31 141

SAMAME, G
Organización de una división de control de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 151

1952

SAMAME G
Programas de control de las enfermedades venéreas de la Oficina Sanitaria Panamericana Oficina Regional de la Organización Mundial de la Salud. *Bol Ofic sanit pan-amer* 32, 37

STOUT G GUZMAN, M & SCRIMSHAW N S
Reacciones serológicas para sífilis presuntamente positivas falsas en la América Central I Incidencia y distribución. *Bol Ofic sanit pan-amer* 32 206

Reacciones serológicas para sífilis presuntamente positivas falsas en la América Central. II Relación con el ácido ascórbico riboflavina, fosfatasa alcalina carotina y vitaminas A y E en el suero sanguíneo *Bol Ofic sanit pan-amer* 32, 521

REIN C. R., KITCHEN D K., MARQUEZ, F & VARELA, G
Penicilina de acción retardada en el tratamiento del mal del pinto en el campesino mexicano estudio clínico y serológico *Bol Ofic sanit pan-amer* 33 95

BAUER, T J
Tratamiento y control modernos de las enfermedades venéreas *Bol Ofic sanit pan-amer* 33 105

STOUT G., MENDEZ, J & GUZMAN M
Reacciones serológicas para sífilis presuntamente positivas falsas en la América Central III Relación con el contenido de proteína, albumina y globulina en el suero *Bol Ofic sanit pan-amer* 33 110

GAYOSO P C
Métodos modernos de control de las enfermedades venéreas *Bol Ofic sanit pan-amer* 33 116

FUNES, J M & AGUILAR C. LUZ
La solución de mafarside-orvus en la profilaxis de la blenorragia en la mujer *Bol Ofic sanit pan-amer* 33 121

SAMAME G E.
Naturaleza y extensión del problema del pian en las Américas *Bol Ofic sanit pan-amer* 33 126

GOODMAN H
Método para vencer la renuencia de los enfermos venéreos a revelar sus contactos *Bol Ofic sanit pan-amer* 33 142

SIMPSON W G & MURPHY V
Necesidad de mejorar la formación profesional de las enfermeras de venereología. *Bol Ofic sanit pan-amer* 33 146

1953

BONNE, W M GUTHE, T & REYNOLDS, F W
El Papel de la Organización Mundial de la Salud en el control del pian. *Bol. Ofic sanit pan-amer* 34, 340

EDMUNDSON W F
Control antivenereo por la aplicación profiláctica de penicilina a grupos muy expuestos. *Bol Ofic sanit pan-amer* 34 347

GUIMARÃES, F N
El pian en Brasil. *Bol Ofic sanit pan-amer* 34 468

ROBERTS P W
Informe clínico sobre el empleo de la penicilina en el tratamiento de 100 casos de mal de pinto *Bol Ofic sanit pan-amer* 34 542

SALAS A C.
Control de las enfermedades venéreas en la zona fronteriza Mexicana Estadounidense *Bol Ofic sanit pan-amer* 35 124

GUEVARA, J A & MASI, D A.
Control de las enfermedades venéreas en el Paraguay *Bol Ofic sanit pan-amer* 35 132

HILL, K. R.
Tratamiento del pian con antibióticos distintos de la penicilina *Bol Ofic sanit pan-amer* 35 147

EDMUNDSON W F RICO A L. & OLANSKY S
Estudio clinicoserológico del mal de pinto *Bol Ofic sanit pan-amer* 35 163

Monographs

HILL, K R. KODIJAT R. & SARDADI, M
Atlas of framboesia (*World Health Organization Monograph Series* No 5 also published in *Bull Wld Hlth Org* 1951 4 201)

PANGBORN M C MALTANER F., TOMPKINS V N BEECHER, T THOMPSON W R. & FLYNN M R.
Cardiolipin antigens (*World Health Organization Monograph Series* No 6 also published in *Bull Wld Hlth Org* 1951 4 151)

1949

WRIGHT R. D & NICHOLSON F P
Treatment as a factor in the control of the venereal diseases *Bol Ofic sanit pan amer* 28 462
COUTTS W E
Organización de la lucha antivenerea bases principales en que actualmente debe apoyarse una campaña *Bol Ofic sanit pan-amer* 28 545

1950

ARNOLD R C & MAHONEY J F
Función de los antigenos de cardiolipina en la serologia de la sífilis *Bol Ofic sanit pan-amer* 29 397
Tecnica de floculación en portaobjetos de VDRL prueba de floculación en tubo de VDRL prueba de VDRL para líquido cefalorraquídeo *Bol Ofic sanit pan-amer* 29 509
THOME J V
Modificaciones que deben hacerse a las actividades educativas antivenereas de acuerdo con los progresos registrados en su terapéutica con el uso de los antibióticos *Bol Ofic sanit pan-amer* 29 945
GOODEN D R
Influencia de un programa profiláctico penicilinico en la incidencia de las enfermedades venéreas *Bol Ofic sanit pan amer* 39 1051

1951

SAMAME G
Profilaxis sistémica antivenerea informe preliminar sobre el programa de Tijuana B C *Bol Ofic sanit pan-amer* 30 42
CUTLER J C & STOUT G
Problemas serológicos en Centro América *Bol Ofic sanit pan-amer* 30 321
Control o erradicación de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 169 (Editorial)
REIN C. R
Problemas en el serodiagnóstico de la sífilis *Bol Ofic sanit pan-amer* 31 105
KITCHEN D K.
Penicilinoterapia moderna desenvolvimiento eficacia reacciones *Bol Ofic sanit pan-amer* 31 118
BREWER F A
Los nuevos antibióticos en el tratamiento de las enfermedades venéreas *Bol Ofic sanit pan amer* 31 127
SANCHEZ PEREZ R
Epidemiologia de las enfermedades venéreas *Bol Ofic sanit pan-amer* 31 132
STOUT G W & REYNARD R
Primera encuesta serológica centroamericana *Bol Ofic sanit pan amer* 31 141
SAMAME G
Organización de una división de control de las enfermedades venereas *Bol Ofic sanit pan-amer* 31 151

1952

SAMAME G
Programas de control de las enfermedades venéreas de la Oficina Sanitaria Panamericana Oficina Regional de la Organización Mundial de la Salud *Bol Ofic sanit pan-amer* 32 37
STOUT G GUZMAN M & SCRIMSHAW N S
Reacciones serológicas para sífilis presuntamente positivas falsas en la America Central I Incidencia y distribución *Bol Ofic sanit pan-amer* 32 206
Reacciones serológicas para sífilis presuntamente positivas falsas en la America Central. II Relación con el ácido ascórbico riboflavina fosfatasa alcalina carotina y vitaminas A y E en el suero sanguineo *Bol Ofic sanit pan-amer* 32 521

WHO publications may be obtained by payment in local currency, directly or through a bookseller, from the following agents

ARGENTINA
Editorial Sudamericana, S.A.
Calle Alsina 500
Buenos Aires

AUSTRALIA
H. A. Goddard Pty. Ltd
255a George Street
Sydney

AUSTRIA
B. Wüllerstorff
Waagplatz 4
Salzburg
Gerold & Co
I. Graben 31
Vienna 1

BELGIAN CONGO
Librairie congolaise
12 av. des Aviateurs
Léopoldville

BELGIUM
Office international de Librairie
184 rue de l'Hôtel-des-Monnaies
Bruxelles

BRAZIL
Livraria Agir
Caixa Postal 3291
Rio de Janeiro D.F.

CANADA
The Ryerson Press
299 Queen Street West
Toronto, Ontario
Périodica
5112 av. Papineau
Montréal 34

CHILE
Edmundo Pizarro
Merced 846
Santiago

COSTA RICA
Trejos Hermanos
Apartado 1313
San José

CUBA
La Casa Belga
René de Smedt
O'Reilly 455
Habana

DENMARK
Einar Munksgaard, Ltd
Nørregade 6
Copenhagen

EGYPT
Librairie "La Renaissance d'Egypte"
9 Sharia Adly Pasha
Cairo

FINLAND
Akateeminen Kirjakauppa
Keskuskatu 2
Helsinki

FRANCE
Masson & Cie, Éditeurs
120 bd Saint-Germain
Paris VI

GERMANY
Elwert & Meurer
Hauptstrasse 101
Berlin-Schöneberg
W. E. Saarbach
Gereonstrasse 25-29
Köln 1
Alex. Horn
Spiegelgasse 9
Wiesbaden

GREECE
Librairie internationale
Eleftheroudakis
Place de la Constitution
Athènes

HAITI
Max Bouchereau
Librairie "A la Caravelle"
Boîte postale 111-B
Port-au-Prince

INDIA
Oxford Book & Stationery Co.
Scindia House
New Delhi

INDONESIA
N.V. "N.I.G.C.T. van Dorp & Co"
Djalan Nusantara 22
Djakarta

IRELAND
The Stationery Office
Dublin

ISRAEL
Heiliger & Co
3 Nathan Strauss Street
Jerusalem

ITALY
Edizioni Minerva Medica
Corso Bramante 83-85
Torino

LEBANON
Librairie Universelle
Beyrouth

LUXEMBOURG
Librairie J. Schummer
Place Guillaume
Luxembourg

MEXICO
La Prensa Médica Mexicana
Ediciones Científicas
Durango 145
Mexico City 7, D.F.

NETHERLANDS
N.V. Martinus Nijhoff's
Boekhandel en Uitgevers
Maatschappij
Lange Voorhout 9
The Hague

NORWAY
Johan Grundt Tanums Forlag
Kr. Augustsgt.
Oslo

PHILIPPINES
Alemar's
749 Rizal Avenue
Manila

PORTUGAL
Livraria Rodrigues
186 Rua Aurea
Lisboa

SWEDEN
Aktiebolaget C. E. Fritzes
Kungl. Hovbokhandel
Fredsgatan 2
Stockholm 16

SWITZERLAND
Medizinischer Verlag
Hans Huber
Marktgasse 9
Bern

SYRIA
Librairie Universelle
Damas

THAILAND
Pramuan Mit Ltd
55 Chakrawat Road
Wat Tuk
Bangkok

TURKEY
Librairie Hachette
469 av. de l'Indépendance
Istanbul

UNION OF SOUTH AFRICA
Van Schaik's Bookstore (Pty)
Booksellers and Stationers
Pretoria

UNITED KINGDOM
H.M. Stationery Office
P.O. Box 569
London S.E.1

UNITED STATES OF AMERICA
Columbia University Press
International Documents Service
2960 Broadway
New York 27, N.Y.

URUGUAY
Oficina de Representación de
Editoriales
Prof. Héctor D'Elía
18 de Julio 1333, Palacio Díaz
Montevideo

YUGOSLAVIA
Drzavno Preduzece
Jugoslovenska Knjiga
Terazije 27/II
Beograd

1949

WRIGHT R D & NICHOLSON F P
Treatment as a factor in the control of the venereal diseases *Bol Ofic sanit pan-amer* **28** 462
COUTTS W E
Organización de la lucha antivenerea bases principales en que actualmente debe apoyarse una campaña *Bol Ofic sanit pan-amer* **28** 545

1950

ARNOLD R C & MAHONEY J F
Función de los antigenos de cardiolipina en la serologia de la sífilis *Bol Ofic sanit pan-amer* **29** 397
Técnica de floculación en portaobjetos de VDRL prueba de floculación en tubo de VDRL prueba de VDRL para líquido cefalorraquídeo *Bol Ofic sanit pan amer* **29** 509
THOME J V
Modificaciones que deben hacerse a las actividades educativas antivenéreas de acuerdo con los progresos registrados en su terapéutica con el uso de los antibióticos *Bol Ofic sanit pan-amer* **29** 945
GOODEN D R
Influencia de un programa profiláctico penicilínico en la incidencia de las enfermedades venéreas *Bol Ofic sanit pan-amer* **39** 1051

1951

SAMAME G
Profilaxis sistémica antivenérea informe preliminar sobre el programa de Tijuana B C *Bol Ofic sanit pan-amer* **30** 42
CUTLER J C & STOUT G
Problemas serológicos en Centro America *Bol Ofic sanit pan-amer* **30** 321
Control o erradicación de las enfermedades venereas *Bol Ofic sanit pan-amer* **31** 169 (Editorial)
REIN C R
Problemas en el serodiagnóstico de la sífilis *Bol Ofic sanit pan-amer* **31** 105
KITCHEN D K
Penicilinoterapia moderna desenvolvimiento eficacia reacciones *Bol Ofic sanit pan-amer* **31** 118
BREWER F A
Los nuevos antibióticos en el tratamiento de las enfermedades venéreas *Bol Ofic sanit pan-amer* **31** 127
SANCHEZ PEREZ R
Epidemiologia de las enfermedades venéreas *Bol Ofic sanit pan-amer* **31** 132
STOUT G W & REYNARD R
Primera encuesta erológica centroamericana *Bol Ofic sanit pan-amer* **31** 141
SAMAME G
Organización de una división de control de las enfermedades venéreas *Bol Ofic sanit pan-amer* **31** 151

1952

SAMAME G
Programas de control de las enfermedades venéreas de la Oficina Sanitaria Panamericana, Oficina Regional de la Organización Mundial de la Salud *Bol Ofic sanit pan-amer* **32** 37
STOUT G GUZMAN M & SCRIMSHAW N S
Reacciones serológicas para sífilis presuntamente positivas falsas en la America Central I Incidencia y distribución *Bol Ofic sanit pan-amer* **32** 206
Reacciones serológicas para sífilis presuntamente positivas falsas en la América Central. II Relación con el ácido ascórbico riboflavina fosfatasa alcalina carotina y vitaminas A y E en el suero sanguineo *Bol Ofic sanit pan-amer* **32** 521

1951

Symposia on syphilis *Chron Wld Hlth Org* 5 9
Anti Venereal Disease Commission for Rhine River Area *Chron Wld Hlth Org* 5 72
Cardiolipin antigens *Chron Wld Hlth Org* 5 265

1952

Venereal-disease-control demonstration in India *Chron Wld Hlth Org* 6 90
First International Symposium on Yaws Control *Chron Wld Hlth Org* 6 253
Mass treatment of syphilis in an Indian province *Chron Wld Hlth Org* 6 266
The International Treponematosis Laboratory Center *Chron Wld Hlth Org* 6 290
A rapid method for the serodiagnosis of syphilis *Chron Wld Hlth Org* 6 301

1953

Endemic syphilis in Bosnia *Chron Wld Hlth Org* 7 4
Venereal-disease-control demonstration in Egypt *Chron Wld Hlth Org* 7 142
Venereal infections and treponematoses *Chron Wld Hlth Org* 7 147
Report of the study group on syphilis at the Sixth World Health Assembly *Chron Wld Hlth Org* 7 203

Grin E I
Epidemiology and control of endemic syphilis report on a mass treatment campaign in Bosnia (*World Health Organization Monograph Series* No 11 also published in *Bull Wld Hlth Org* 1952 7 1)

World Health Organization
First International Symposium on Yaws Control (*World Health Organization Monograph Series* No 15 also published in *Bull Wld Hlth Org* 1953 8 7 390)

Reports of Experts and Study Groups

Expert Committee on Venereal Infections and Treponematoses
First Report (*Official Records of the World Health Organization* 1948 **8** 60)
Second Report (*Official Records of the World Health Organization* 1949 **15** 18)
Third Report (*World Health Organization Technical Report Series* 1950 **13**)
Fourth Report (*World Health Organization Technical Report Series* 1953 **63**)

Expert Committee on Venereal Infections and Treponematoses Subcommittee on Serology and Laboratory Aspects
First Report (*World Health Organization Technical Report Series* 1950 **14**)
Second Report (*World Health Organization Technical Report Series* 1951 **33**)

Venereal disease control in the USA report of the WHO Syphilis Study Commission (*World Health Organization Technical Report Series* 1950 **15**)

Special Publications

International List of Venereal Disease Treatment Centres at Ports
Personal Booklet (issued to seamen for recording treatment of venereal disease at ports)

Chronicle of the World Health Organization

1948

Venereal diseases an international problem *Chron Wld Hlth Org* **2** 15
New international effort against venereal diseases *Chron Wld Hlth Org* **2** 267

1949

Serology of syphilis *Chron Wld Hlth Org* **3** 14
Penicillin in venereal diseases *Chron Wld Hlth Org* **3** 15
Venereal-disease control in Poland *Chron Wld Hlth Org* **3** 29
Venereal diseases in Ethiopia. *Chron Wld Hlth Org* **3** 83
Venereal disease in Germany *Chron Wld Hlth Org* **3** 111
Venereal-disease control among Rhine River boatmen *Chron Wld Hlth Org* **3** 117
Penicillin treatment of syphilis *Chron Wld Hlth Org* **3** 285

1950

New developments in venereal-disease control *Chron Wld Hlth Org* **4** 35
Serology of syphilis *Chron Wld Hlth Org* **4** 41
Venereal-disease control in the USA *Chron Wld Hlth Org* **4** 67
International conference on the serodiagnosis of syphilis *Chron Wld Hlth Org* **4** 150
Lymphogranuloma venereum *Chron Wld Hlth Org* **4** 345
Serology of syphilis *Chron Wld Hlth Org* **4** 367

1951

Symposia on syphilis *Chron Wld Hlth Org* 5 9
Anti Venereal Disease Commission for Rhine River Area *Chron Wld Hlth Org* 5 72
Cardiolipin antigens *Chron Wld Hlth Org* 5 265

1952

Venereal-disease-control demonstration in India *Chron Wld Hlth Org* 6 90
First International Symposium on Yaws Control *Chron Wld Hlth Org* 6 253
Mass treatment of syphilis in an Indian province *Chron Wld Hlth Org* 6 266
The International Treponematosis Laboratory Center *Chron Wld Hlth Org* 6 290
A rapid method for the serodiagnosis of syphilis *Chron Wld Hlth Org* 6 301

1953

Endemic syphilis in Bosnia. *Chron Wld Hlth Org* 7 4
Venereal-disease-control demonstration in Egypt. *Chron Wld Hlth Org* 7 142
Venereal infections and treponematoses *Chron Wld Hlth Org* 7 147
Report of the study group on syphilis at the Sixth World Health Assembly *Chron Wld Hlth Org* 7 203

No 11

EPIDEMIOLOGY AND CONTROL OF ENDEMIC SYPHILIS

Report on a Mass-Treatment Campaign in Bosnia

E I GRIN

The natural course of endemic syphilis including its epidemiological clinical laboratory and other aspects has not been adequately described in existing literature This study represents an important contribution to the limited knowledge on the subject The environmental factors and their influence on the perpetuation of the infection as an endemic disease and the course of the disease over decades are discussed and original theories and new considerations are advanced explaining its behaviour in a primitive environment A description is given of the different stages of the treatment campaign in Bosnia in which more than 35 000 cases were treated with penicillin and promising results obtained The volume is profusely illustrated with maps drawings and photographs

English edition only 1953 93 pages 43 figures

5/ $1 00 Sw fr 4 —

No 15

FIRST INTERNATIONAL SYMPOSIUM ON YAWS CONTROL

A collection of papers presented at the International Symposium on Yaws Control held in Bangkok in March 1952 is published here in book form They deal with the use of antibiotics in the treatment of yaws the epidemiology of the disease and the modern control methods including the problems of organizing eradication campaigns The symposium will be of interest to venereologists to all those concerned with the use of antibiotics and to persons responsible for planning or carrying out mass treatment or control campaigns

Mixed language edition English and French 1953 second impression 1953 iv + 418 pages 32 plates 26 figures 83 tables

22/6 $4 50 Sw fr 18 —

WHO publications may be obtained by payment in local currency directly or through a bookseller from the following agents

ARGENTINA
Editorial Sudamericana S.A
Calle Alsina 500
Buenos Aires

AUSTRALIA
H A Goddard Pty Ltd
255a George Street
Sydney

AUSTRIA
B W llerstorff
Waagplatz 4
Salzburg
Gerold & Co
I. Graben 31
V nn 1

BELGIAN CONGO
Librairie congolaise
12 des Aviateurs
Leopoldville

BELGIUM
Office international de Librairie
184 rue de l'Hôtel-des-Monnaies
B uxelles

BRAZIL
Livraria Agi
Caixa Postal 3291
Rio d Janeir D F

CANADA
The Ryerso Press
299 Queen Street West
T onto Ontario
Periodica
5112 P pinea
Montreal 34

CHILE
Edmundo Pizarr
Merced 846
Santiago

COSTA RICA
Trejos Hermanos
Apartad 1313
San José

CUBA
La Casa Belg
René de Smedt
O Reilly 455
Ha ana

DENMARK
Ejnar Munk gaard, Ltd
Nørregade 6
Copenhagen

EGYPT
Librairie La Renaissance d Egypte"
9 Sharia Adly Pasha
Cairo

FINLAND
Akateeminen Kirjaka ppa
Keskuskatu 2
Helsinki

FRANCE
M sson & Cie Editeurs
120 bd Saint-Germain
Paris 6e

GERMANY
Elwert & Meurer
Ha ptstrasse 101
B rlin-Schöneberg
W E Saarbach
Gereonstrasse 25-29
Colog
Alex Horn
Spiegelgasse 9
W esbaden

GREECE
Librairie Internati ale
"Eleftheroudakis"
Place de la Constitution
Athens

HAITI
Max Bouchereau
Librairie A la Caravelle
Boîte postal 111 B
Po t u-Princ

INDIA
Oxford Book & Stationery Co
Scindia House
New Delhi

INDONESIA
N V /h O C T D rp & Co
Djalan Nusantara 22
D aka a

IRELAND
The Stationery Office
Dublin

ISRAEL
Heiliger & C
3 N han Strauss Street
Jerusalem

ITALY
Edizioni Minerva Medic
Corso B ama te 83-85
Turin

LEBANON
Lib airie Uni ersell
Beirut

LUXEMBOURG
Librairie J Schummer
Place Guillaum
Luxembourg

MEXICO
La Prensa Médica Mexicana
Edici nes Cientificas
Durang 145
Mexico City 7 D F

NETHERLANDS
N V Martinus Nijhoff
Boekha del en Uitgevers
Maatschappij
Lange Voorhout 9
The Hague

NORWAY
J ha Grundt Tan m Forlag
Kr Augustgt. 7a
Oslo

PHILIPPINES
Alemar's
749 Rizal Avenue
Manila

PORTUGAL
Livr ria Rodrigues
186 Rua A rea
Lisbon

SWEDEN
Aktiebolaget C E Fritzes
K gl H bokhandel
Fredsgatan 2
Stockholm 16

SWITZERLAND
Medizinischer Verlag
H ns H ber
M k gasse 9
Berne

SYRIA
Librairie Universell
D mascus

THAILAND
Pr mua Mit Ltd
55-59 Ch krawat Road
Wat uk
Bang k

TURKEY
Librairie Ha hette
469 de l'Indépenda ce
Ist nbul

UNION OF SOUTH AFRICA
V Schaik Booksto (Pty)
Booksellers and Stationers
Preto ia

UNITED KINGDOM
H M Stati nery Office
P O Bo 569
London S E 1

UNITED STATES OF AMERICA
Col mbi University Press
In erna nal Documents Service
2960 Broadw y
New York 27 N Y

URUGUAY
Oficina de Representació de Editoriales
Prof Héctor D Eli
18 de Juli 1333 Pal cio Diaz
Montevideo

YUGOSLAVIA
Državn Preduzeće
Jugosl enska Knjiga
Terazije 27/II
Belgrad

Orders may also be addressed to

Sales Section Palais des Nations Geneva, Switzerland,

but must be paid for in one of the currencies in which pri es are quoted below

No 11

EPIDEMIOLOGY AND CONTROL OF ENDEMIC SYPHILIS

Report on a Mass-Treatment Campaign in Bosnia

E I GRIN

The natural course of endemic syphilis including its epidemiological clinical laboratory and other aspects has not been adequately described in existing literature This study represents an important contribution to the limited knowledge on the subject The environmental factors and their influence on the perpetuation of the infection as an endemic disease and the course of the disease over decades are discussed and original theories and new considerations are advanced explaining its behaviour in a primitive environment A description is given of the different stages of the treatment campaign in Bosnia in which more than 35 000 cases were treated with penicillin and promising results obtained The volume is profusely illustrated with maps drawings and photographs

English edition only 1953 93 pages 43 figures

5/ $1 00 Sw fr 4 —

No 15

FIRST INTERNATIONAL SYMPOSIUM ON YAWS CONTROL

A collection of papers presented at the International Symposium on Yaws Control held in Bangkok in March 1952 is published here in book form They deal with the use of antibiotics in the treatment of yaws the epidemiology of the disease and the modern control methods including the problems of organizing eradication campaigns The symposium will be of interest to venereologists to all those concerned with the use of antibiotics and to persons responsible for planning or carrying out mass t eatment or control campaigns

Mixed language edition English and French 1953 second impression 1953 iv + 418 pages 32 plates 26 figures 83 tables

22/6 $4 50 Sw fr 18 —

WHO publications may be obtained by payment in local currency directly or through a bookseller, from the following agents

ARGENTINA
Editorial Sudamericana S.A
Calle Alsina 500
Buenos Aires

AUSTRALIA
H A. Goddard Pty Ltd
255a George Street
Sydney

AUSTRIA
B Wüllerstorff
Waagplatz 4
Salzburg
Gerold & Co
I, Graben 31
Vienna 1

BELGIAN CONGO
Librairie congolaise
12 a des Aviateurs
Léopoldville

BELGIUM
Office International de Librairie
184 rue de l'Hôtel-des-Monnaies
Bruxelles

BRAZIL
Livraria Agir
Caixa Postal 3291
Rio de Janeiro D.F

CANADA
The Ryerson Press
299 Queen Street West
Toronto Ontario
Periodica
112 a P pineau
Montreal 34

CHILE
Edmundo Pizarro
Merced 846
Santiago

COSTA RICA
Trejos Hermanos
Apartado 1313
San José

CUBA
La Casa Belga
René de Smedt
O Reilly 455
Habana

DENMARK
Einar Munksgaard, Ltd
Nørregade 6
Copenhagen

EGYPT
Librairie "La Renaissance d'Egypte"
9 Sharia Adly Pasha
Cairo

FINLAND
Akateeminen Kirjakauppa
Keskuskatu 2
Helsinki

FRANCE
Masson & Cie Editeurs
120 bd Saint-Germain
Paris 6e

GERMANY
Elwert & Meurer
Hauptstrasse 101
Berlin-Schöneberg
W E Saarbach
Gereonstrasse 25-29
Cologne
Alex Horn
Spiegelgasse 9
Wiesbaden

GREECE
Librairie Internationale
"Eleftheroudakis"
Place de la Constitution
Athens

HAITI
Max Bouchereau
Librairie "A la Caravelle"
Boîte postale 111 B
Port-au-Prince

INDIA
Oxford Book & Stationery Co
Scindia House
New Delhi

INDONESIA
N V Boekhandel W v Hoeve en Dorp & Co
Djalan Nusantara 22
Djakarta

IRELAND
The Stationery Office
Dublin

ISRAEL
Blumstein & Co
3 Nathan Strauss Street
Jerusalem

ITALY
Edizioni Minerva Medica
Corso Bramante 83-85
Turin

LEBANON
Librairie Universelle
Beirut

LUXEMBOURG
Librairie J. Schummer
Place Guillaume
Luxembourg

MEXICO
La Prensa Médica Mexicana
Ediciones Científicas
Donato 145
Mexico City 7 D F

NETHERLANDS
N V Martinus Nijhoff
Boekhandel en Uitgevers Maatschappij
Lange Voorhout 9
The Hague

NORWAY
Johan Grundt Tanum Forlag
Kr Augustsgt 7A
Oslo

PHILIPPINES
Alemar's
749 Rizal Avenue
Manila

PORTUGAL
Livraria Rodrigues
186 Rua Aurea
Lisbon

SWEDEN
Aktiebolaget C E. Fritzes
Kungl Hovbokhandel
Fredsgatan 2
Stockholm 16

SWITZERLAND
Medizinischer Verlag
Hans Huber
Marktgasse 9
Berne

SYRIA
Librairie Universelle
Damascus

THAILAND
Pramuan Mit Ltd
55-59 Chakrawat Road
Wat Tuk
Bangkok

TURKEY
Librairie Hachette
469 av de l'Indépendance
Istanbul

UNION OF SOUTH AFRICA
Van Schaik's Bookstore (Pty)
Booksellers and Stationers
Pretoria

UNITED KINGDOM
H M Stationery Office
P O Box 569
London S E 1

UNITED STATES OF AMERICA
Columbia University Press
International Documents Service
2960 Broadway
New York 27 N Y

URUGUAY
Oficina de Representación de Editoriales
Prof Héctor D'Elía
18 de Julio 1333 Palacio Díaz
Montevideo

YUGOSLAVIA
Državno Preduzeće
Jugoslovenska Knjiga
Terazije 27/II
Belgrade

Orders may also be addressed to
Sales Section, Palais des Nations Geneva, Switzerland,
but must be paid for in one of the currencies in which prices are quoted below

No 11

EPIDEMIOLOGY AND CONTROL OF ENDEMIC SYPHILIS

Report on a Mass-Treatment Campaign in Bosnia

E I GRIN

The natural course of endemic syphilis including its epidemiological clinical laboratory and other aspects has not been adequately described in existing literature This study represents an important contribution to the limited knowledge on the subject The environmental factors and their influence on the perpetuation of the infection as an endemic disease and the course of the disease over decades are discussed and original theories and new considerations are advanced explaining its behaviour in a primitive environment A description is given of the different stages of the treatment campaign in Bosnia in which more than 35 000 cases were treated with penicillin and promising results obtained The volume is profusely illustrated with maps drawings, and photographs

English edition only 1953 93 pages 43 figures

5/ $1 00 Sw fr 4 —

No 15

FIRST INTERNATIONAL SYMPOSIUM ON YAWS CONTROL

A collection of papers presented at the International Symposium on Yaws Control held in Bangkok in March 1952 is published here in book form They deal with the use of antibiotics in the treatment of yaws the epidemiology of the disease and the modern control methods including the problems of organizing eradication campaigns The symposium will be of interest to venereologists to all those concerned with the use of antibiotics and to persons responsible for planning or carrying out mass treatment or control campaigns

Mixed language edition English and French 1953 second impression 1953 iv + 418 pages 32 plates 26 figures 83 tables

22/6 $4 50 Sw fr 18 —

WHO publications may be obtained by payment in local currency directly or through a bookseller from the following agents

ARGENTINA
Editorial Sudamericana S.A
Calle Alsina 500
BUENOS AIRES

AUSTRALIA
H A Goddard Pty Ltd
255a George Street
SYDNEY

AUSTRIA
B W Bernorff
Waagplatz 4
SALZBURG
Gerold & C
I. Graben 31
V enn 1

BELGIAN CONGO
Librairie congolaise
12 des Aviateurs
LEOPOLDVILLE

BELGIUM
Office international de Librairie
184 rue de l Hôtel-des-Monnaies
B USSELS

BRAZIL
Livraria Agir
Cai Postal 3291
RIO E JANEIRO D.F

CANADA
The Ryerson Press
299 Queen Street West
TORONTO Ontario
Periodica
5112 a P pineau
MONTREAL 34

CHILE
Edm ndo Pizarro
Merced 846
SANTIAGO

COSTA RICA
Trejos Hermanos
Apartado 1313
SAN JOSÉ

CUBA
La Casa Belg
René de Smed
O'Reilly 455
HA AN

DENMARK
Ejna Munksgaard Ltd
N rregade 6
COPENHAGEN

EGYPT
Librairie "La Renaissance d Egypte
9 Sharia Adly Pasha
CAIRO

FINLAND
Akateeminen Kirjaka ppa
Keskuskatu 2
HELSINKI

FRANCE
Masson & C[ie] Editeurs
120 bd Saint-Germain
PARIS 6[e]

GERMANY
Elwert & Meurer
H ptstrasse 101
B LIN-SCHÖNEB RG
W E Saarbach
Gereonstrasse 25-29
COLOG E
Alex Horn
Spiegelg sse 9
WIESBADEN

GREECE
Librairie internationale
Eleftheroudakis
Place de la Constitution
ATHENS

HAITI
Max Bouchereau
Librairie "A I Cara lle
Boite postale 111 B
PO T-AU-PRINCE

INDIA
Oxford Book & Stationery Co
Scindia House
NEW DELHI

INDONESIA
N V /BOCT *Dorp & Co*
Djalan Nusantara 22
D AKART

IRELAND
The Stationery Office
D BLIN

ISRAEL
Heiliger & Co
3 N ha Strauss S reet
JERUSALEM

ITALY
Edizioni Minerva Medic
Corso B ama 83-85
TURIN

LEBANON
Librairie Universelle
BEI UT

LUXEMBOURG
Librairie J Schummer
Place G ill ume
LUXEMBOU G

MEXICO
La Prensa Médica Mexica
Ediciones Cientificas
Duran 145
MEXICO CITY 7 D F

NETHERLANDS
N V M rti us N jhoff's
Boekhandel en Ui gevers
Maatschappij
Lange Voorhout 9
TH HAGU

NORWAY
J han Grundt Tanum Forlag
Kr Augustsgt 7A
OSLO

PHILIPPINES
Alemar's
49 Rizal Ave ue
MANILA

PORTUGAL
Livr ria Rodrigues
186 Rua A rea
LISBON

SWEDEN
Aktiebolaget C E. Fritzes
Kun l Hovbokhandel
Fredsg tan 2
STOCKHOLM 16

SWITZERLAND
Medizinische Verlag
H ns H ber
M rkg sse 9
BERNE

SYRIA
Librai ie Universelle
D M SCUS

THAILAND
Pramuan Mit Ltd
55 59 Chakrawat Road
W t tuk
B NGKOK

TURKEY
Librairie H chette
469 de l'Indépendance
Ist UL

UNION OF SOUTH AFRICA
V Sch ik *Bookstore (Pt)*
Booksellers and Stationers
P eto ia

UNITED KINGDOM
H M Stationery Office
P O Bo 569
LONDON S E 1

UNITED STATES OF AMERICA
C l mbi Universi y Press
I ernational Documents Service
2960 Broadw y
N w Yor 27 N Y

URUGUAY
Oficina de Representación de Editoriales
Prof Héct D Ella
18 de Juli 1333 Palacio Diaz
MONTEVID O

YUGOSLAVIA
Državno Produzeće
J oslovensk Knji
T razij 27/II
BELGRAD

Orders may also be addressed to

Sales Section, Palais des Nations Geneva, Switzerland

but must be paid for in one of the currencies in which prices are quoted below